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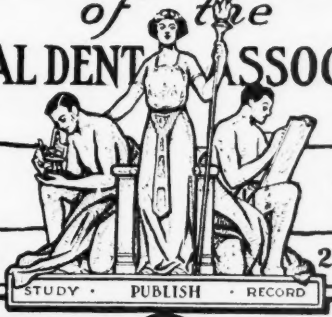

MARCH, 1920

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Diseases of the Maxillary Sinus.—*Oakman.*

Congenital Non-Occlusion.—*Stillman.*

Etiology of Periodontoclasia.—*Merritt.*

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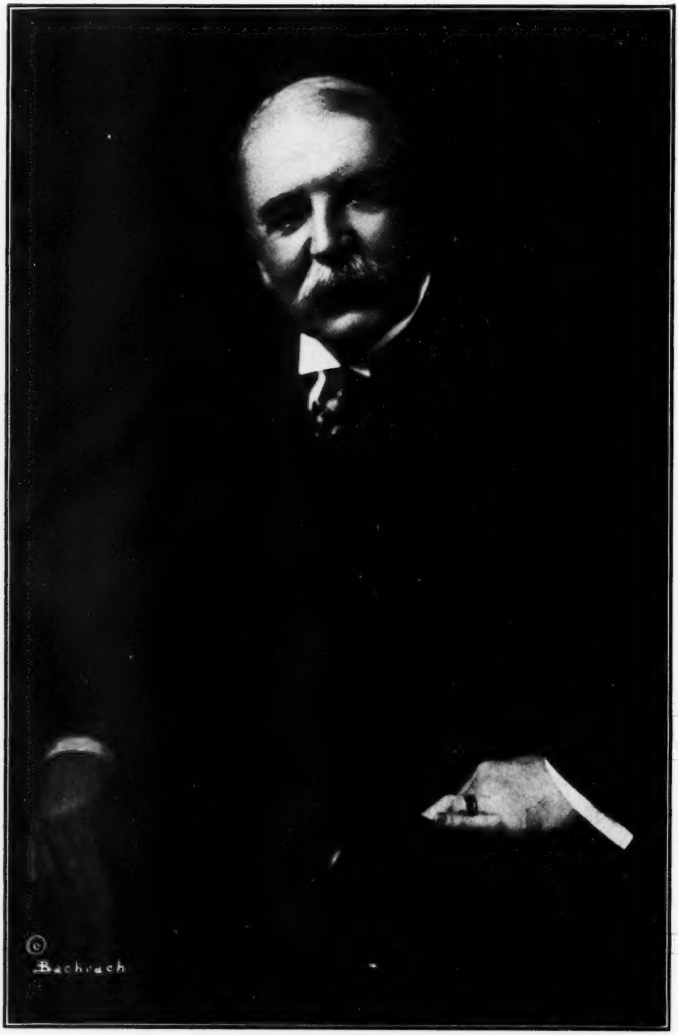

B. HOLLY SMITH, M.D., D.D.S.
(President of Faculty, The Baltimore College of Dental Surgery.)
1858—1920.

THE JOURNAL
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VOL. 7 MARCH, 1920 NO. 3

Original Communications.

THE X-RAY IN DENTAL PRACTICE.

By C. Edmund Kells, D. D. S., New Orleans, La.

(Subject) **THE CRIME OF THE AGE.**

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

TO HAVE been selected as one of the essayists upon this most notable occasion is, indeed, considered a very high honor and fully appreciated, more especially as this meeting is being held in my own home town.

"All the world's a stage,
And all the men and women merely players."

The center of the stage is now held by the pulpless tooth, and the X-ray is the limelight which produces the spot in which it stands.

I trust that what I bring before you this evening will prove of interest to all, and spur those most interested in the subject to further endeavor, because, undoubtedly, we are merely on the threshold of an unexplored region—focal infection—about which so little is now known.

However, before going into the details of the subject, let us take a hasty survey of what the Roentgen Ray can do for the—well, let us not say patient, but rather for the specialist.

For this purpose, we will lay off the body into zones, and beginning at the top we will work downwards. The first zone includes the very top of the cranium and the whole of the back of the head, and this is the special domain of the

brain specialist, who X-rays this territory for various purposes under varying conditions.

The next zone includes the frontal sinuses and antra, and these are, of course, the special privileges of the otologist, who depends largely upon skiagraphs for his diagnosis.

Next we come to the oral cavity, a fertile field for numerous specialists in the dental line and for some plain dentists as well, and here the X-ray is indispensable.

The next zone includes the tonsils, but up to this writing, this zone has proven a disappointment to the Roentgenologist for, thus far, tonsillectomy has not required the use of the ray. But science is advancing every minute and there is no telling how soon he will discover that his art is absolutely necessary for this work. It certainly would be a confession of defeat if the tonsils alone, of all organs of the body, would refuse to surrender to the skill of the Roentgenologist.

The trachea is next in line for a zone of its own, and must be rayed whenever foreign bodies accidentally become lodged therein.

Then in rapid succession follow the lungs, heart, stomach, gall bladder, kidneys, etc, etc., in all of which the X-ravist revels.

After a patient has had his frontal sinuses drained, his antrum scraped, his teeth proven infected, and extracted—whether they were infected or not—his tonsils removed, his lungs fluoroscoped, his stomach outlined, his gall bladder extirpated, *his* uterus and ovaries removed if *he* should happen to be built that way, or if not, there is no cause for worry as there are other organs just as handy for the surgeon—after all this has been done, I say, one would naturally think that the Roentgenologist would be satisfied. Wrong again, for after the patient has been relieved of all these removable appurtenances, and there is nothing further left within him to X-ray, the ingenious Roentgenologist gives his patient a free lunch of bismuth and then takes moving pictures of it as it travels down the alimentary canal. Believe me, no one has anything on the twentieth century Roentgenologist.

We are conversant with the old time method of separating the cream from the milk. The milk was put in a pan and the cream gradually rose to the surface from which it was skimmed in due time. There's the rub, that element of time. "Time is money" these days. Now electricity turns the trick. The milk is pumped into one side of a whirling receptacle and instantly there flows from the other side one stream of cream and another of skimmed milk.

As to speed and efficiency, when it comes to separating a despairing patient from his coin, the electric cream separator has nothing on the X-ray machine.

Ancient History.

Fortunately for me, I have the pleasure of now showing you the apparatus which I used in the early days of X-ray work. This is one of the very first types of tubes made for X-ray work and it has a single focus. This was soon followed by a similar tube with a double focus as here seen. These tubes were made for use with a Tesla Coil.*

The vacuum in these tubes was soon raised by their use, and it was again lowered by means of heat. They were very erratic.

The next improvement in tubes was an automatic adjustment of the vacuum of which I now show a sample. These tubes have been treasured during all these years and are now interesting relics.

The Tesla Coil used at that time was disposed of later on, being replaced by a more powerful machine. I have here for your inspection a Tesla Coil which, if not the one originally used by me, at

*Here Dr. Kells displayed the tubes in question.

least is one of the earliest types. It is now the property of Tulane University and was loaned me for this meeting.

Compare this exhibit with the modern X-ray machine to be seen at this meeting, and you may appreciate what handicaps the original workers were under.

It may be of interest to hear that with this coil and tube and the films *available at that time,* a fairly good outline of an impacted lower third molar could be taken in *twelve minutes.*

In August, 1896, it was my privilege to take this outfit to Ashville and give before the Southern Dental Association the first dental X-ray clinic ever held. So much for Ancient History.

Dentistry of To-day.

Dentistry is at last coming into its own—not only into *its* own, but also into a very great deal more than its own.

While the fact that certain conditions of the teeth cause certain systemic troubles was recognized and written about, and teeth were extracted to relieve these systemic conditions, *more than one hundred years ago,* it has been only during the past two or three years that the mania for extracting devitalized teeth, whether good, bad or indifferent, has reached such an extent that it is now time for some determined effort to be made to check the evil, and I can assure you that it was only with this object in view that I consented to appear before you this evening.

I, therefore, now raise my voice in protest against this unholy practice, and by clinical evidence, I hope to substantiate my position.

The Roentgen Ray.

I believe that the Roentgen Ray is the one greatest asset of the oral diagnostician today, and I also believe that by the imperfect understanding and misinterpretation of dental skiagraphs by incompetent and inexperienced persons, untold harm has been and is being done to a multitude of sufferers.

I believe the Roentgen Ray an absolute necessity to a high class dental practice. Thirty years ago we filled our root-canals as best we could, and none other could do any better—that is, any better than his best—but today if we do not check up these fillings by means of the ray, there are plenty of others who do so check them, and, therefore, are doing better than we. There is no mistake about that.

Exodontia cannot be practiced without the ray, and it is indispensable in orthodontia. Even in prosthodontia there are times when it is well to be assured in advance that there are no buried root fragments or unerupted teeth to erupt later on and destroy the value of the prosthetic appliance.

In peridontia alone it can have but little value—the pyorrhea specialist who cannot diagnose pyorrhea and sufficiently gage its extent without the aid of the ray, had, undoubtedly, better engage in some other specialty.

The time is now here when it is fully recognized that the general practitioner of dentistry is not fully capable of rendering his patients THE VERY BEST SERVICES unless his equipment includes an X-ray machine.

However, we must not forget that the *mere possession* of such an apparatus does not necessarily mean that better service will follow—in fact it may be harmful. It requires but little skill and no practice to take a poor skiagraph. No one can expect to become a proficient radiologist and diagnostician over night.

We have heard of "The Lure of the Wild." Is it not the *wildest kind of a "lure"* to believe that one can purchase an X-ray outfit and the following day, and every day thereafter, have it "operated by his girl"—satisfactorily, of course, it is understood—while the operator himself is doing "productive work," as is so graphically described and illustrated in the advertisements that

greet us in the pages of our Dental Journals?

PROGRESSIVE DENTISTRY.

Several years ago the celebrated Dr. Mayo in a paper read before the Chicago Dental Society said: "The next great step in medical progress along the line of preventive medicine should be made by dentists. The question is—will they do it?"

Undoubtedly, dentistry has been making good in this line, and I now suggest that the next great progressive step for dentistry to take is to induce medical colleges to include in their regular curricula a few lectures given by dentists upon the conditions to be met within the oral cavity, and to impress upon the students just a few fundamental facts about the mouth which every physician should know.

The physician should be especially impressed with the necessity for stressing upon the recent mother the necessity for the care of the deciduous teeth, and not let her grow up in ignorance of their great value.

If a physician could be taught the practical impossibility of *satisfactorily* replacing lost teeth, he would not be so quick to order their extraction.

It is an everyday occurrence, now that this craze for extracting teeth is on, for the physician to order out a tooth or several teeth which for cosmetic or other reasons must be replaced by artificial substitutes.

The twentieth century dentist in mistaken kindness, most frequently restores them by bridges—in many cases *devitalizing the pulp in an adjoining tooth* for the purpose. Could anything be more absurd? A tooth is extracted solely because of its dead pulp and immediately a live and healthy pulp is destroyed, and yet this is common practice endorsed by the highest medical and dental authorities. In a comparatively short time, these piers fail and then—what?

How much better in this respect was the dentistry of our fore-fathers, which my generation was taught?

I have had a number of patients to wear small gold plates, carrying one or two anterior teeth (early lost by accidents) for over twenty-five years without the least injury to the adjoining teeth, and one phenomenal case where the patient wore such a plate for more than fifty years. That is dentistry more to my liking, I must confess, and I trust that in the not distant future, partial plates, carrying when necessary artistically carved porcelain blocks, will be revived and these abominable small fixed bridges become a thing of the past.

There must be no such thing as being satisfied with conditions presenting ever. One cannot stand still—he retrogrades or he progresses. The progressive dentist must be constantly imbued with a spirit of "constructive discontent."

To the prosthetists who are now banded together, must we look for the partial denture which will satisfy both patient and dentist, and thus do away with the fixed bridge as a rule, and only allow it in exceptional cases.

Up to ten or fifteen years ago, it was not so very unusual to see partial plates carrying artistically carved porcelain blocks that were a pleasure to look upon, but now this appears to be almost a lost art. Dr. Walter Bartlett, Professor of Prosthesis in the Washington University, School of Dentistry, St. Louis, teaches this work. There may be others, but I do not know of them. Let us hope that the prosthetists will take this up and make it popular.

THE CONSIDERATION OF THE PATIENT.

The welfare of the patient should and must be the main consideration of both the physician and the dentist, and to that end they should work in harmony. Not only the physical welfare, but his

financial welfare should be considered, and, therefore, under no consideration should unnecessary skiagraphs be taken for which the patient is made to pay.

It is not unusual for a physician to instruct a patient to go to some special man and have all his teeth X-rayed. To have these instructions carried out, means, in many instances, from eight to twelve separate skiagraphs, and if this patient is sent to a Roentgen laboratory, or a radiodontist, just that many pictures, irrespective of whether they are necessary or not, will naturally be taken and charged for.

The only object of the skiagraph in such cases is to reveal the condition of the roots of diseased teeth, or to show unerupted teeth and root fragments.

When such a patient is sent to a plain, ordinary dentist who does his own X-ray work, such instructions from the physician are naturally completely ignored, and he only takes the number of skiagraphs that are really necessary and not one more.

Very frequently many of the teeth in such cases are vital and perfect, and do not require raying. Frequently pyorrhea obtains in a greater or lesser degree and in such cases, no skiagraphs are of any value whatever; therefore, to take such skiagraphs and charge for them, is deliberately wronging the patient.

I have had patients sent to me with instructions to have "all the teeth X-rayed" for whom I did not take a single picture—not one was indicated.

Again, for a thoro diagnosis in some cases, some teeth need to be rayed from two or three angles, and no one but a dentist can decide such details.

I am confident that no physician would willingly advise his patients to pay for a lot of dental skiagraphs which would be of no earthly value, and yet scores of them are doing that very thing every day, thoughtlessly, of course. I am also confident that these self-same physicians, when they come to realize that it is very seldom necessary to skiagraph all of the teeth for an oral diagnosis, and that no one but a dentist can advise which teeth and which regions should be diagnosed by the X-ray, will cease sending their patients DIRECTLY to the Roentgen laboratory or radiodontist, but refer these patients to *their own dentists* for this oral diagnosis. Should any of these dentists not be equipped with an X-ray apparatus, they should carefully diagnose the mouth, marking upon charts just what regions they want rayed, and if any region should be rayed from more than one angle, specifying just what is needed, and then he, the dentist, sends the patient to whomsoever he selects, be he radiodontist or radiologist, and then the patient is assured that he pays for no unnecessary pictures. In this manner, physician and dentist work in harmony to the best interest of their common patient.

Quite recently a lady patient of most moderate means, or to state the case more exactly, of practically no means at all, was sent by a physician to a radiodontist to have her teeth rayed. Amongst the skiagraphs brought in—in this case only four were taken—was one of the roots of a lower molar in the familiar position we know so well; separated and lying flat on the gum—completely exfoliated. These roots were rayed and diagnosed as "infected." Skiagraphs charged for. Wasn't that a crime committed under the cloak of professionalism? The poor woman was in tears because she really did not have the money to spare for these pictures. Of the four taken, only one was necessary. She paid for three unnecessary and worthless pictures, and this by a professional man.

This is only a sample of frequent experiences. Is it not time to put a stop to such practice?

However much we may decry his "profession", we at least admire the *nerve* of the lone Highwayman, who "holds up" a coach full of able bodied men and

deliberately robs them, but the *professional* man who holds up his trusting and helpless patients, is even beneath our contempt.

Thus it is that the conscientious physician who has the welfare of his patient at heart, must see to it that he, at least, shall not be a party to the taking of unnecessary skiagraphs.

The Consideration of So-Called "Dead Teeth."

The "Schoolmaster is Abroad," and disseminating the idea that the dead tooth is as dangerous as a rattle snake and should be extracted, and that is the idea which the progressive element of the dental profession must combat and combat immediately and intensively.

Upon hearing such an expression, we naturally wonder if the exponent of such a theory is perfectly sincere. If he, himself, possessed any pulpless teeth at the same time he became converted to the rattle snake theory, did he at once proceed to have them extracted, notwithstanding the fact that they had been filled for years, had been perfectly comfortable and useful during all of this time, and still were so, and that he was in perfectly good health at the moment of his conversion? Or, if he unfortunately now lost the pulp of a tooth, would he at once have it extracted even tho it were an incisor? Question.

That a dead tooth must necessarily be infected, is the wildest of errors. That an infected root cannot be rendered sterile, is just as fallacious. Abscessed teeth, the roots of which were filled more than twenty-five years ago, that show apparently normal conditions in the skiagraph today, and the patients in perfect health, are clinical evidences of this fact which cannot be controverted.

Scores of skiagraphs have been published of cases "before and after," showing that the radioluscent areas have been filled in with apparently healthy tissues subsequent to the filling of their root-canals. Nature will sometimes accomplish wonders, notwithstanding the handicap frequently placed upon her by dentists.

Now comes the operator who says that he has opened into such apparently healthy areas (goodness knows but he certainly has accommodating patients) and found them infected. Then we ask, how it is that periapical areas are an exception to the general rule? Is it not a fact that in all other parts of the body when that infected area is eradicated and new tissue is rebuilt, that the new tissue is a healthy one?

Quite recently I attended a meeting of the New England Dental Association at which Henry Cotton, M. D., read a paper entitled "The Relation of Oral Infection to Mental Diseases." Undoubtedly Dr. Cotton has accomplished wonderful results in his insane asylum by the extraction of teeth, but his environment and the conditions under which he is working must be taken into consideration when he says that every devitalized tooth should be extracted, and we can but conclude that he is looking at the subject thru tinted glasses.

Again, on the other hand, a well known dentist, and one whose opinion should be worth considering, tho it evidently is not in this case, says, "Devitalized teeth properly treated are forever secure against infection." He, also, must be using tinted glasses.

When a number of patients fall into the hands of an extremist, most of them fare badly—when they fall into the hands of a capable, conservative man, most of them fare well. Let us keep to the middle of the road.

A young mechanic in whom I was interested met with an accident by which his leg was badly crushed. He was hurried to the hospital where the surgeon in charge, after a careful examination of the case, decided that nothing less than an amputation was possible.

Before this was done, however, Dr.

Joseph A. Danna appeared upon the scene. He examined the boy carefully and said, "Anybody can amputate a leg, let us see if we cannot save this boy's leg," and save it he did. The boy walks well today, and bear in mind, my hearers, this was a charity patient.

Let us apply this idea of Dr. Danna's to dentistry. Anybody can extract a tooth—let us try to save every one possible by replanting, by amputation, by apicoectomy, if you will,—no matter by what means, just so it is saved for a period of usefulness, at least.

Every physician must know that under certain circumstances the Fallopian tubes and tonsils become infected, and later on the organisms become starved out and the pus becomes sterile without the patient's having undergone any treatment whatsoever.

Such being the case, can we not reasonably assume that sterile pus, or no pus at all, may exist in a small radioluscent area about the apex of the tooth, the root of which has been apparently satisfactorily sterilized and filled?

Let us consider a root with a typical abscess. The end of the root is bathed in serum which enters the fine root-canal and soon becomes stale. Bear in mind that organisms thrive in stale serum, but cannot live in perfectly fresh serum.

When the root-canal is cleaned out, sterilized and filled to its end with an antiseptic material, the fine culture tube (root-canal) is thus obliterated, and there is no longer any opportunity for organisms to propagate.

The constant flow of fresh serum into the area of the abscess soon destroys, thru its bactericidal properties, the bacteria therein, and this area finally becomes sterile. Then begins the process of restoration, and in time the parts return to normal as shown by the skiagraph.

This theory conforms to the clinical facts. Any one to whom the theory is not satisfactory, must present some other theory—but the clinical facts cannot be disputed—alveolar abscesses can frequently be cured.

The Radioluscent Area.

Upon the screen we will now show in Figure 1 a typical dental skiagraph. About the apex of the tooth is shown the typical "radioluscent area." It is safe to say that hundreds of such skiagraphs are being taken every day for persons suffering from some disease attributed to focal infection. The radioluscent areas are marked "infected" and the teeth are ordered out forthwith.

Can such a case be correctly diagnosed as infected upon the showing of such a skiagraph? *Most emphatically not.*

Figure 1.

There are certain elements shown in a dental skiagraph that can usually be positively distinguished, and there are others that cannot be distinguished at all.

In the picture upon the screen, we can safely recognize the tooth. We see its pulp chamber and root-canal. We do not know whether the pulp is alive, putrescent, or has been removed and the space filled perfectly with some foreign radioluscent substance. The pulp casts no distinguishing shadow upon the film.

Now we see this radioluscent area about the apex. There is nothing by which its contents can be distinguished. All that the picture discloses to the careful observer is that this space is not normal. It may contain harmful organisms; it may contain sterile pus; it may

contain a sterile fluid. Neither the one nor the other can be distinguished by the ray.

In Figure 2 is shown a photograph of

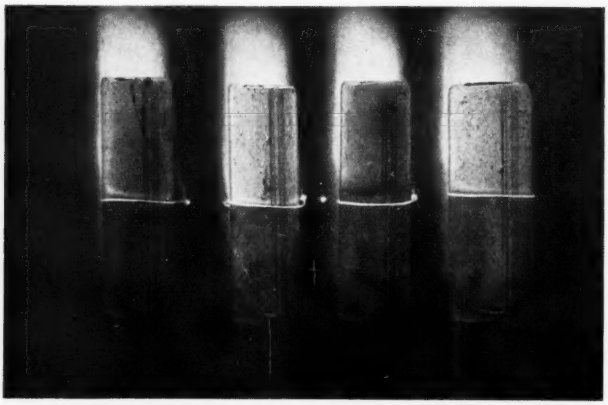


Figure 2.

four tubes. One contains sterile pus and the others streptococcus, staphylococcus, etc., and in Figure 3 we see skiagraphs of these tubes. The pictures all look alike. The contents of no tube casts any shadow. The organisms cannot be distinguished from sterile pus. The vial might as well have been empty.

Here is graphically proven that pus of no kind, sterile or harmful, casts any distinguishing shadow upon the film and cannot be distinguished by skiagraphs the one from the other.

I challenge these diagnosticians who mark these radioluscent areas "infected" to point out the tubes containing such infections, and if they cannot distinguish streptococci veridans when they see it in wholesale lots of 2 c. c. in a vial, tell me how in the name of heaven they can recognize a microscopic amount when deeply imbedded in the jaw.

The Root-canal Problem.

The root-canal problem is the most important problem of today in modern dental practice. It is most important for two reasons. The one, on account of its far reaching effect upon the patient, and the other, because thus far, no satisfactory solution of the problem has either been reached or appears to be in sight.

I say "satisfactory solution" advisedly because a large number of wild extremists have apparently solved it to their

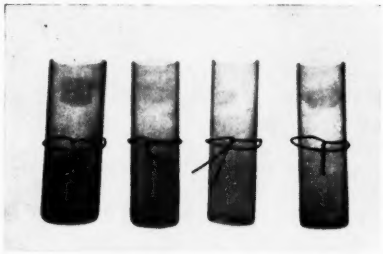


Figure 3.

own satisfaction by ordering the wholesale extraction of all dead teeth.

While this may be satisfactory to themselves, I very greatly fear that in a very short time a reaction will set in, and when many of these patients find

that they have lost their valuable teeth and not been cured of the ills these dead teeth were supposed to have caused, they will then be far from satisfied.

Nowhere in the world is there a medical institution to which a live human being can be sent with orders either to cut out its appendix, or to remove its tonsils, or to have any other operations performed and forthwith the deed immediately and blindly follows the word.

Imagine, if you can, what would happen if any dentist in Boston, I care not who he is, should decide that the tonsils of some child required removing, and would send this child to the Forsyth infirmary with a chart marked "Tonsils Infected—to be removed." Would they be removed without an examination? Again, what do you think would happen if some physician of this city, no matter what his standing, was to tag a patient. "Remove Appendix," send him up to the Touro, have him prepared and etherized for the operation and call in Dr. Matas to perform it at the last moment when all was ready? Would not such a physician have to show cause for his not being confined in an asylum?

There are no establishments in the medical profession that operate that way, and no operations are performed in medical amphitheatres that have not been diagnosed and decided upon by the operating surgeon.

What of the dental profession? This, unfortunately, presents a very different aspect, and not a pleasing one to contemplate. Right today scores of X-ray laboratories run by medical men are promiscuously X-raying the teeth of the patients sent there for the purpose, diagnosing the cases, and ordering the extraction of teeth.

"Promiscuously" is hardly the word to use—"unfortunately" would seem more appropriate, as it certainly is unfortunate for very many, if not most, of these patients, because these medical men are in no position to recognize the real conditions which exist in many cases.

I concede to physicians and radiodontists the legal right to take dental skiagraphs, but I have had experience more than ample to convince me that they have not acquired the necessary knowledge to enable them to correctly diagnose any dental lesions except of the simplest kind.

How are these men to recognize a vital tooth from a devitalized one? It is not to be expected that they can for they have never been taught to do so, and the man does not live who can discern infection in a skiagraph. Frequently certain teeth are condemned and marked by them as infected and ordered out, when any ordinary dentist, upon examination of the teeth themselves, would recognize these special teeth to which I now refer as vital. The patient is then sent to an exodontist; the operator in charge looks at the chart; the teeth have been ordered out by a man supposed to be in good standing—and, in fact, he is in good standing, tho he should not be—the teeth are extracted and the mutilation is complete.

Possibly the exodontists are not altogether to blame. The change in methods has been more or less gradual, and, undoubtedly, few of them have ever considered the subject from the point of view now presented. The time will come, however,—the time must come—when no exodontist of *standing* will extract a tooth upon the orders of a physician. A dentist, and no one but a dentist, should sign the death certificate of a tooth. The Lord only knows why physicians should want to sign such certificates. Don't they sign enough such certificates in their own legitimate line?

Besides conceding to the Roentgenologist and radiodontist the legal right to take dental skiagraphs, I will go a step

farther and say that there is, undoubtedly, a large field of usefulness for them in the dental line.

While there are a large number of dentists who are equipped with X-ray apparatus, there is a very much larger number without it. Many of these men want skiagraphs taken from time to time, and would prefer to send their patients to an X-ray laboratory or radiodontist rather than to another dentist for that purpose.

There are perfectly good and valid reasons for this preference and, therefore, radiologists and radiodontists should take skiagraphs for these dentists, but I again insist that it is only for dentists, that they should take dental skiagraphs.

Focal Infection.

The moment a patient appears before his physician with some systemic trouble, probably or possibly caused by some infection, the idea seems to be to at once jump upon the teeth.

This is as it should be, but all one's energies should not be expended upon these organs, nor should it be forgotten for one instant that there are other organs in the body that may be at fault.

The diagnosis for a focus of infection should be of an eliminative character, and to be thoro, the sinuses, antra, teeth and tonsils of both sexes, besides special abdominal organs of each sex must be carefully gone over.

In many cases, infected teeth can be readily diagnosed and upon their extraction, the patient is restored to health. On the other hand, in very many cases, the true condition about the apices of some most valuable teeth cannot be diagnosed, and, of course, such teeth should never be extracted until all other possible foci of infection have been eliminated, and then only as a last resort.

Personally, I extract no teeth that I have not myself condemned, and before the extraction of such teeth, *supposedly the cause* of some systemic trouble, the patient is informed and the point is well stressed that skiagraphs do not always furnish the means for a positive diagnosis, and possibly no amelioration of the trouble may follow. Then, should the patient have one or more teeth extracted and no benefit follow, he can have no recourse on me. We must always bear in mind that many valuable teeth have been extracted solely upon the strength of skiagraphic findings, and no benefit resulted. I only extract such teeth when all other possible sources of infection have been supposed to have been eliminated.

Oral Diagnosis.

In oral diagnosis, for possible foci of infection by pulpless teeth and in the outlining of a course of treatment for them, I pursue a definite policy based upon a careful study of the cases which have come under my care and their subsequent clinical records, and this policy is consistently followed.

Each case is examined by a stereotyped form which brings the examination down to ordinary routine work, and thus saves a world of time. The form now used is shown in Figure 4.

The diagram is executed as dictated by the mouth conditions. Missing teeth are crossed out. Crowns and bridges are indicated in a simple manner. Doubtful teeth which require raying are checked off, and any necessary data can be entered upon the sheet. After the skiagraphs are taken, the diagram is traced in red ink to correspond to the skiagraphic findings. The films then can be filed away as being of no further immediate use. It takes time to examine a number of films, while the red ink diagram is like a printed page before you.

Primarily pulpless teeth are divided into three fundamental classes; and the plan can best be shown in tabloid form.

Figure 4.

ORAL DIAGNOSIS

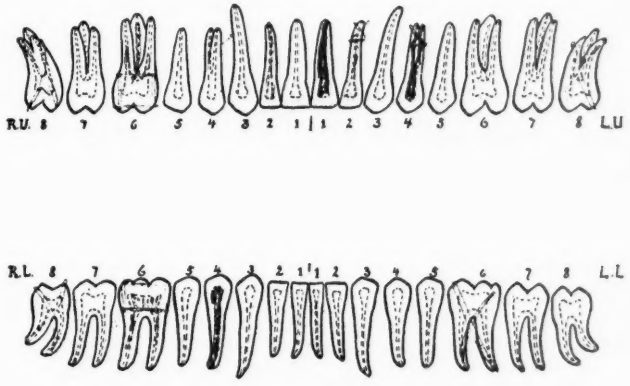
October 8th, 1919.

Captain John Doe,
New Orleans, La.

Referred by Dr. Smith.
For possible focal infection. √
For possible cause of reflex pain.

Antra examined? Yes.
Sinuses examined? Not recently.
Tonsils examined? Out four years ago.
Blood count taken? Some time ago. Negative.
Skiagraphs taken? Yes, but not recently.
Prostate examined? No.

DIAGRAMMATIC (SKIAGRAPHIC) CLINICAL PICTURE.



History: Vision perfect, but eyes give out after use of about an hour or two. Trouble is of eight or nine years' standing, but has gotten worse recently. Patient has been very thoroly examined several times during this period by various men of note, and no possible cause of his trouble discovered.

Apices of left upper lateral and first bicuspid were cut off some time ago. Appendix was removed four years ago.

Condition of Mouth: Teeth and gums in very good condition. Several crowns and devitalized teeth in evidence. Several teeth missing. All doubtful areas should be skiagraphed.

Skiagraphic Findings: All areas from which teeth are missing are clear. The skiagraphs show apparently imperfect root-canal fillings in right lower first molar and right upper first molar, yet their apical areas appear satisfactory. All other root-canal fillings appear satisfactory and their apical areas appear satisfactory. The areas about the amputated root **appear** satisfactory. If the eye trouble really was caused by infected root-canals, one certainly would expect to find radioluscent areas about the apices of these teeth which have been devitalized for so long—fifteen years or more—and yet no such areas are seen.

Treatment suggested:

1. Prostate should be examined.

2. The molars should be opened, cultures taken from ends of root-canals **if possible**, and the roots refilled.

3. Areas about the amputated roots should be explored and cultures taken therefrom, **if possible.**

Conclusions: This is, undoubtedly, a very obscure case, and further treatment should be based upon the above findings. That the teeth are causative factors in this trouble is extremely doubtful, and no teeth should be extracted save as a last resort and with the patient well impressed with the uncertainty of the result.

A. Pulpless teeth; roots unfilled.	Skiagraph shows no radioluscent area	Root ends normal	Root canals should be filled
		Root ends absorbed	Possibly hopeless.
	Skiagraph shows radioluscent area	Root ends normal	Radioluscent area should be sterilized and canals filled
		Root ends absorbed	Probably hopeless
B. Pulpless teeth; roots partly filled.	Skiagraph shows no radioluscent area	Root ends normal	Filling should be removed and canals refilled
		Root ends absorbed	Probably hopeless
	Skiagraph shows radioluscent area	Root ends normal	Filling should be removed, radioluscent area sterilized and canals refilled
		Root ends absorbed	Probably hopeless
C. Pulpless teeth; roots apparently well filled to their ends.	Skiagraph shows no radioluscent area	Root ends normal	These teeth should undoubtedly be considered safe
		Root ends absorbed	These teeth should be considered doubtful and extracted only where conditions warrant
	Skiagraph shows radioluscent area	Root ends normal	These teeth should be considered doubtful and extracted only where conditions warrant
		Root ends absorbed	Probably hopeless

To Be Remembered.

Radioluscent areas around apparently well filled roots, or roots apparently not well filled, are not always infected. Cultures have been taken from many of these and found sterile.

Classifications.

Here we find a definite classification for every case, and every case is followed by a definite course of treatment. To follow this method is a simple and as positive as operating an adding machine in which you press the keys as desired, and at the end of the operation, the sum total appears before your eyes. Under the method just described, I merely record my findings, follow the plan, and at the end of this procedure, the proper line of treatment is laid before me automatically.

When this diagnosis calls for the extraction of any single rooted tooth which, as a rule, must for cosmetic effects be immediately replaced by an artificial tooth, it is my policy to advise replanting. Replanting of lower molars is, as a rule, not indicated, altho I once replanted such a tooth and it gave good service for nineteen years.

Frequently one root of a diseased lower molar is in better condition than the other, and it is sometimes possible to extract both roots and replant one only.

Where one root appears perfectly good and the other hopeless, it certainly is good practice to cut off and extract the bad one only, leaving the good one in position. Such remaining roots have been restored by large amalgam fillings or crowns and proven useful for many years. By many, I mean more than five.

The Object of Dentistry.

If the object of dentistry is conservatism, why is not the treatment as just outlined dentistry of the highest type? The prime object of the dentist being to preserve the natural teeth, every effort should be made to preserve every tooth,

whether vital or pulpless, just as long as it can be made to function properly and is not a menace to the patient's health.

Duplicating Skiagraphs.

It is a well known fact that, as a rule, skiagraphs taken at intervals of several months are of no value as demonstrating the regeneration of bone between and around the roots of teeth as a result of treatment for pyorrhea, because, unless the skiagraphs are taken from the same angles, the pictures are not replicas of each other. To take skiagraphs from predetermined angles has heretofore been impossible, but recently Dr. F. T. Van Woert has perfected a very simple film holder by which it is possible to do this, and undoubtedly his device will be of inestimable value.

Figure 5.

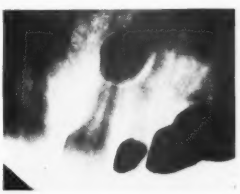


Figure 6.

In order to substantiate the claims set forth in this paper, I offer the following evidence:

I have said that medical men were usually not in a position to diagnose any but the simplest dental lesions as shown upon dental skiagraphs.

In Figure 5 is shown a skiagraph of a lower bicuspid region—nothing very unusual to be seen. This picture was one of a series taken by one of the largest and best known X-ray laboratories in the East, and the report upon this particular film reads as follows:

"Slight area of inflammation may be present at apex of lower right second bicuspid. Tooth has the appearance of being a temporary one unless root has been amputated."

Here is a perfectly natural bicuspid diagnosed as a temporary molar. Can you beat that? A beautiful example of what an M. D. knows about the teeth.

In Figure 6 is shown a case in which a physician—and one of the best—saw the radioluscent (!) area around this unerupted and impacted cuspid in the jaw of a woman of forty-five or over, and said, "I know that is pus there." I disagreed, believing that what he *recognized* as pus was the usual light area to be found around unerupted teeth. The tooth was removed simply because it was impacted and undoubtedly causing reflex pain, and a microscopic examination proved it sterile as was to be expected.

A lady who had been a patient for thirty years or more, came in one morning on crutches, a look of agony upon her face. She had been and still was suffering torture from her foot. She had just been to a Roentgen laboratory and had been "X-rayed from head to foot" as she expressed it. She brought a film of a lower molar which had been condemned as "infected," diagnosed as the cause of her trouble, and with instructions to have it extracted.

Now it just happened that she had a beautiful set of teeth with very few fillings, but her teeth were badly worn by erosion and the molar in question had quite recently become so exquisitely sensitive from this cause that there was

nothing else to do but devitalize it, which had been done a very few weeks before. Upon the strength of this history, I positively refused to extract the tooth as I did not believe it could be the cause of her trouble, and she was perfectly willing to abide by my decision.

Within a week, she was on the table being operated upon for gall stones, and in due time she called at the office without crutches, her "infected" molar still doing good service and thanking me for having saved it.

I would now report a case of a man of about fifty, who had been having pains in his lower limbs to such an extent that at times he could hardly walk. After having passed thru the hands of several specialists, he was sent to me for an oral diagnosis. I reported a number of devitalized teeth that appeared *safe* and one upper lateral that appeared doubtful and suggested replanting this tooth.

Figure 7.

Just about this time the patient got tired of all these specialists (including myself) and decided to go to a celebrated clinic. There it was discovered that his tonsils were at fault, aided and abetted by the lateral above referred to. Advised the removal of the tonsils and the lateral.

The tonsils were removed, and before he had recovered from that operation, his general condition had improved so greatly that the tooth was not extracted, and he soon left for home—*cured.*

We can easily imagine what his opinion was of that New Orleans bunch of specialists, but—unfortunately, he did not stay cured. Very soon he was just as badly off as ever, and then he bethought himself of that lateral which he was advised to have out at the clinic and he proceeded to have it extracted. That resulted in no improvement in his condition.

The loss of the lateral naturally affected his appearance, so he had the pulp in the cuspid destroyed and the lateral bridged in. One dead tooth extracted as the cause of his trouble without attaining any benefit, and another trouble factory started by killing the pulp of the cuspid. This is the kind of *preventive dentistry* medical institutions are responsible for.

Figure 8.

One year later he called and reported his condition just the same as when he first came to me, and I would not be at all surprised if he now considers that New Orleans bunch not so bad after all and possibly wishes he had had his lateral replanted and the cuspid still vital.

Here is a companion picture to the one just described. The patient had lost some thirty pounds within two months without apparent cause, and was sent to me for a diagnosis in hopes that I would charge it to his teeth. A skiagraphic diagnosis revealed a small foreign body,

probably amalgam or cement, with a radiolucent area about it as shown in Figure 7.

In addition to this, the right upper lateral showed a first class "granuloma" at its apex, as shown in Figure 8.

I suggested removing the foreign object and replanting the lateral. The former was done, and about this time the patient decided to go to another well known sanitarium where his teeth were skiagraphed according to rule, and where again, *according to rule,* the lateral, being proven "infected", was ordered out. The loss of the lateral did not strike him as such a happy idea, as replanting was not advised, and so he decided to wait until his return home for that operation.

Figure 9.

In the meantime, *notwithstanding* the treatment they gave him, he steadily improved and in a few months he returned feeling well and at his old weight with the granuloma, which was originally causing all his trouble, still in full blast. Is it not a positive fact that, if he had had the tooth extracted at the sanitarium as advised, his cure would have been attributed to the diagnosis and treatment? Undoubtedly. Now as a matter of fact, it is barely possible that there was some infection around that foreign object which I removed, and that his improvement followed its removal. Or, it may be that he was just in a run-down condition and the change of climate and diet was all he needed to bring him back to par.

Notwithstanding his improved condition, replanting of the lateral was naturally still advised, and he decided to have it done. Now please follow me closely. The tooth was extracted under as aseptic conditions as possible. Smears were taken from the socket and root ends and scrapings from the apical end of the root-canal, all of which were cultured and no pus or organisms were found. It was absolutely sterile.

Such tests have frequently been made in our practice, and so often have the cultures from these apparently infected teeth proven negative that it is now no wonder that *I* never find pus at the ends of the roots by means of the X-ray.

Figure 10.

Hundreds of just such teeth condemned by just such skiagraphs are being extracted every day. If this one was sterile, why not scores of others which are being sacrificed upon the altar of inexcusable ignorance.

In Figure 9 is shown a perfectly vital central diagnosed by an M. D. Roentgenologist as an alveolar abscess.

In Figure 10 is a vital bicuspid which certainly doesn't look so, but there was no mistake about its vitality at the time this picture was taken.

In Figure 11 are shown two unerupted cuspids which might well be taken for two different cases, but they are of one and the same tooth, the pictures having been taken five minutes apart, from different angles of course. This merely

shows a case of distortion by the skiagraph.

In Figure 12 are seen three *apparently* good root-canal fillings made by one of my associates. What should be done to a one hundred per cent vital man who would have extracted these three lower incisors for a young girl without having at least made an attempt to save them? Possibly extracting his own lower incisors might teach him their value.

In Figure 13 is shown an upper bicuspid "before and after" of a young girl of twenty. The tooth was condemned and ordered out by a pretty good dentist because the patient was running a temperature. The root-canals were filled and the temperature was soon reduced to normal. One year has passed, the patient is still O. K. and the tooth is doing good service, of course.

That a dentist can RENDER BETTER SERVICE with an X-ray apparatus in his office, is well illustrated by Figure 14.

Here a lower bicuspid was extracted and the *socket curetted*—all to the satisfaction of the dentist without the ray. The patient came to me later on still suffering, and I rayed the socket of

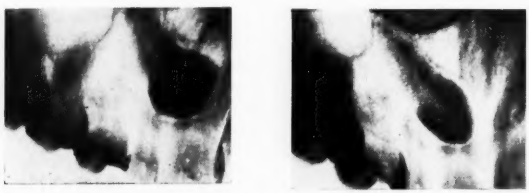


Figure 11.

Figure 12.

course. He was "some" surprised to see the picture.

A young man of about thirty-five, living in the northern part of the state suddenly began to just fade away. There was nothing the matter with him as far as anybody could see. He ate well and slept well, but he was losing weight at an alarming rate, having lost over thirty pounds within a few weeks.

Figure 13.

Naturally, as a last resort, they X-rayed his teeth and, again just as naturally, they found six infected teeth. Anybody could *see the infection* on the film at the ends of these roots, and these six teeth were ordered out.

The dentist who undertook this

wholesale contract, fortunately, (for the patient) broke off the first one and could not get out the root end, and so his physician advised him to come down and see me.

After a careful diagnosis of his case, I suggested that we now remove the root

Figure 14.

fragment just referred to and the adjoining tooth, which did not look good to me, and await the result before extracting the others. This appeared sound reasoning to the patient and was done.

At the end of thirty days, he had regained some twenty pounds and at the end of six months he came to us again, having not only regained his original

Figure 15.

weight, but was now weighing more than ever before, and the four condemned teeth, convicted as infected by the showing of a film, are now doing good service, and a very grateful patient this man has proven himself to be.

I will now show the case of a young lady whose dentist insisted upon extracting a molar simply upon the skiagraphic showing, Figure 15, and she came to me begging that it be saved.

Could I do other than say that an attempt, at least, should be made to save it?

In Figure 16 is shown the finished root-canal work accomplished in our

Figure 16.

office and checked up as satisfactory before being checked out. Wasn't it worth while to gain the gratitude of such a patient and undoubtedly save such a tooth for a number of years? If other teeth, filled under similar circumstances, have stood the test, plenty of them for ten, others for twenty, and

Figure 17.

some few for over twenty-five years, why not give this one a chance, especially when the patient was so anxious to save it?

In Figure 17 is shown a root-canal filling that did not cure the abscess, the sinus still persisting. (Having discontinued general practice, this may be the

last failure to cure an abscess that I have to report.) Shall we extract such a tooth for a young girl of twenty, and then bridge it in? Hardly. Would she be willing to wear a plate? Probably not. Shall we amputate the root end? Not if we heard Dr. Hartzell yesterday, for

Figure 18.

if I understood him correctly, he described the physical condition in which a patient should be in order that success should attend this operation as such a one which only an undertaker could fulfill by embalming the body and then putting it on ice for thirteen days. I think that's Dr. Hartzell's idea. Possibly I misunderstood him, but we'll let it go at that and, therefore, we will NOT amputate the root end. Replanting is undoubtedly indicated here.

In Figure 18 is shown a lower molar which was extracted because the patient was so badly crippled that she had to be carried from her home to the hospital on a litter. It was a desperate case, something had to be done. The tooth was extracted by me; it was cultured, it was sterile. Another good tooth sacrificed on the altar of ignorance. The very next day the cause of her trouble was discovered, it was removed and she has been improving ever since. The full history of this case would be very interesting, but it is too long for such a paper.

A lady, who had been a patient for over thirty years, developed arthritis very suddenly and her physician sent her to a laboratory to have her teeth X-rayed. She brought me the skiagraphs upon which seven teeth were marked "infected" and with instructions to have them extracted.

Naturally, no attention was paid to these instructions nor to the films, which were exceptionally poor. Her case was gone over very carefully, all necessary regions skiagraphed and finally the extraction of one tooth was decided upon. Her arthritis cleared up quickly. Eighteen months have passed and she has not had a return of it notwithstanding she still has those other six *infected* teeth, three of which happen to be still vital.

Upon the left in Figure 19 is seen a lower molar undoubtedly in a pretty bad fix and possibly it is not surprising that its extraction was advised by one of the leading dentists in a large Western city.

Figure 19.

I thought differently, advised replanting which was undertaken. The distal root was extensively decayed and separated from the crown in extraction. It was hopeless.

The mesial root was replanted and later on was crowned as shown upon the

right. Within the year, the whole necrotic area, seen in the original picture, was *apparently* filled in with new bone and the root is solid and doing good work today.

Now all these cases were bad enough, but the worst is yet to come.

A young man about thirty years of age went to a dentist—a dentist this time, mind you—and he was advised to have all of his upper teeth and eight lower teeth extracted, about twenty teeth in all. This did not have a pleasing ring to him, so he sought my opinion. I recommended the extraction of three, and the placing of the rest in the best possible condition with the idea of their lasting a limited number of years only.

Whose advice did he accept? It is needless to say. Think of it, to deliberately mutilate such a young man by extracting all of his upper teeth. In law there is such a crime as mayhem. Are professional men exempt from its infraction? Let us suppose these teeth will last five years. After then, what? Who can foretell what real conservative dentistry will be able to do for unfortunate mankind five years hence? Let us take the chance at any rate.

This evidence could be continued indefinitely, but we will consider this sufficient.

In Conclusion.

At the instant he appears in this world and draws his first breath of life, each little human creature is endowed with certain talents. To some are given few, to others many. Why the discrimination, no one knows.

It is the duty of each and every one of us to be resigned to this rule of Providence, be satisfied with the limitations placed upon him, and to make the very best of these talents, be they few or many; but right now and right here, I can but regret that nature had not been more generous and favored me with the oratorical gifts of an Ottolengui; the convincing powers of a Black; the possibilities of accomplishment of a Hinman; or, coming right back home, the persuasive ability of our own worthy President of this Association, and thus would I be such an influential factor in this great gathering that I could awaken your souls to the realization of the harmful effects of this wholesale and indiscriminate mutilation of the human mouth.

Who is there here tonight enjoying the blessing of a good set of natural teeth, who could stand before a mirror and contemplate their loss without a shudder?

Would that I could induce this Association to approve of the following:

1. To start an intensive compaign against the indiscriminate extraction of "dead teeth."

2. To go on record that it is impossible to recognize pus or other infections AS SUCH in a dental skiagraph.

3. That while Roentgenologists should be in a position to take dental skiagraphs, it is the sense of this Association that they are not always in a position to correctly diagnose dental lesions as depicted upon the film and, therefore, such diagnosis should be made by dentists.

4. That it is the opinion of the National Dental Association that physicians should discontinue to instruct their patients to have teeth extracted, except in rare instances where, for instance, the physician must extract them himself.

5. That the physician should refer his patients to a dentist and no one else for a diagnosis with or without the use of the X-ray.

6. That exodontists refuse to operate upon physicians' instructions.

7. That the time has come when each medical college should have a regular graduate dentist upon its staff to teach its medical students what they should know about the oral cavity.

If I could only succeed in obtaining this representative body of American

dentists as it stands today, to register its approval of these ideas, I confess that I would not consider that my life had been spent in vain.

C. EDMUND KELLS.

Mr. Chairman:

The hour is late; it is time to adjourn. Many of this audience are my friends and as I wish to keep them as such, with your permission I will write my replies to Drs. Tileston and Raper and then, when published, any who are interested can read them. I thank you.

REPLY TO DR. TILESTON.

First let me thank the Chairman for having appointed two such competent members as Drs. Tileston and Raper to discuss this paper.

I fully realized that my ideas upon the subject under discussion would meet with much opposition from certain quarters, and so it is with the greatest gratification that I have such a man as Dr. Tileston, than whom none stands higher in the profession and in the schools, to approve of them as cordially as he does.

Dr. Tileston's characterizing of the wanton extraction of devitalized teeth as a "fad" and then his description of the term, is particularily appropriate. "More zeal than sense"—that's it exactly.

I certainly thank him for his timely expressions upon the subject and especially for bringing my recommendations before the House of Delegates. And I now take the opportunity to thank the members of this section for approving, without a dissenting voice, of the recommendations which I have offered.

WILL THE SLEEPERS NOW PLEASE AWAKEN.

Reply to Dr. Raper.

The first two pages of Dr. Raper's discussion read more like an obituary than anything else, and while I hope it is a little premature and that I really am not a "dead one", it is appreciated all the more for having been heard than it would have been had it been written after it was too late for me to have heard it.

I wish to express my heartfelt appreciation of Dr. Raper's statement that I was the *first dentist* to take dental skiagraphs. He says, "The radiograph was made within one year after the discovery of the X-ray." Dr. Raper is correct; it was taken not only within the year, but probably within four months, as the discovery was announced by Professor Roentgen in December 1895, and I took my first picture *about April,* 1896, and in August, only eight months after the discovery, the clinic at Ashville was given. Several members of this meeting have told me that they were present at this clinic.

A photo of my first X-ray laboratory, shown in Figure 20, may prove of interest. Upon the left of the row of tubes is seen one of the first type made for the Tesla Coil. Note the tube stand holding one of the later tubes! This photograph was taken in 1898 or early in 1899.

The reason I see but little value of skiagraphs to peridontists is that the skillful radiodontist can purposely, and the ordinary radiologist can, thru ignorance, show up a six months' growth of bone *between* the roots of teeth in pictures taken two minutes apart! Its all in the angles at which the two pictures are taken.

Regarding Dr. Raper's reference to the League of Nations, it just occurs to me that possibly the apparently purposeless objection to the League by a few prominent politicians may be due to defects in their teeth. I certainly am sorry that this did not occur to me before, that I might have incorporated it in my paper and thus have settled the whole business!

I have read and re-read Dr. Raper's discussion with great interest, and I believe that we, notwithstanding his statement to the contrary, are both working

along the same lines and are practically agreed upon all points.

For reasons quite beyond my control, it was not possible for me to have sent Dr. Raper a copy of my finished paper, and so a "collection of elaborated notes" were sent him, and in their "revision and re-arrangement," some little changes occurred. In this manner, the allusion to a *Race* was omitted, so his criticism of this race is not applicable, thru no fault of his of course.

I did not say that the general practitioner *must* have an X-ray apparatus. The paragraph reads, "The general practitioner of dentistry is not fully capable of rendering his patients the VERY BEST SERVICES unless his equipment includes an X-ray machine." Quite a difference. I am in no position to tell dentists what they *must do*, but over twenty years in general practice with an X-ray machine at hand places me in a position to know what "service" I have been able to render thru its aid. *Service*, when used in conjunction with dentistry, means the right kind of attention at the instant it is required. That's real service.

I have frequently taken as many as three skiagraphs of one root-canal operation at one sitting while the rubber-dam was on, and without the loss of appreciable time. This could not have been done unless I had taken the skiagraphs in my own office. Time and again have I taken one or two with the dam on.

Again, a patient calls for relief from a buried root which should be extracted. Would I probe in the dark for the root? Of course not; a skiagraph, taken instantly and ready for inspection in from five to seven minutes, would allow me to intelligently extract the root. Many other instances of the necessity for

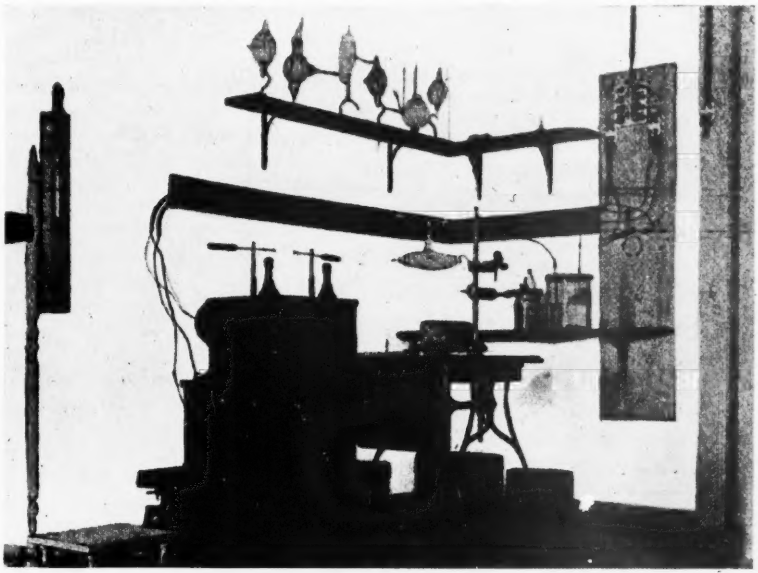


Figure 20.
Taken from the Dental Cosmos 1898 or 1899.

immediate skiagraphs could be given, but are unnecessary as they must occur to all.

Dr. Raper asks: "Who is responsible for the propaganda that the dentist must buy an X-ray machine? Do the manufacturers have anything to do with it?" I might add, "Who is responsible for the dentists buying high priced dental chairs and cabinets and electric engines?' And I will answer him and myself. The *manufacturers* of course. They spend thousands of dollars advertising in our Journals, which advertisements many progressive dentists (myself included) scan possibly with much more interest than is given some of the articles. Dr. Raper should have seen their wonderful exhibits at this meeting.

The reason the progressive and *conscientious* dentist buys the best chair, cabinet, engine and best instruments, is that he believes they will allow him to do better work than he could do with inferior equipment, and the same reason will control the same class of men who install their own X-ray machines, while many of a different class will buy these machines and install them in conspicuous places in their offices for very different reasons. We cannot prevent that.

Now friend Raper, you evidently have been mis-informed. I have not limited my practice to *Radiodontia* and Minor Oral Surgery. My new cards read:

Dental X-ray Diagnosis
Minor Oral Surgery
Consultations.

There you have it in full. I am not a radiodontist, nor do I practice radiodontia.

The oral diagnostician should stand in the same relative position to the public as does the internist. I do not believe that every dentist, (40,000 or more in this country) will ever do his own X-ray work. As I have already explained *who* I think should do it, I will not repeat. The radiologist and the radiodontist will have the work of many dentists to take care of for some time to come.

Dr. Raper charges me with being inconsistent in that I advocate that every dentist do his own X-ray work and yet, having given up general practice of dentistry, I offer my services for X-ray work.

There is a vast difference between commercialism and professionalism. The more a salesman sells you articles which you *do not need,* the better is his salesmanship, while the professional man spends a good part of his life serving his patients against his own financial interests. I have in the last thirty years advised hundreds of patients not to have a missing molar or bicuspid replaced by means of a bridge and, therefore, have lost thereby thousands of dollars.

I now advise dentists to do their own X-ray work. If that is against my own financial interest, it is of no consequence. I just believe the better class of dentists should do it, and believing so, it is but natural for me to say so.

It is not necessary to *disregard my words and judge from my actions* in order to establish my claim for existence as an Oral Diagnostician. I believe the time has arrived when there is as much necessity for the Dental Consultant as there is for the Consulting Physician, and this has nothing to do with radiodontists or dentists taking skiagraphs.

Very recently a patient came straight from one of the largest and best known clinics in the country with a set of eleven dental skiagraphs, and good ones they were. Eight teeth (including a central) were ordered out. This did not appeal to her. She came to me for advice, *which she accepted as final*—eight teeth will not be extracted. So much for the *Oral Diagnostician.*

So, taking it all in all, I think brother Raper and I are traveling towards the same goal, tho we may be upon different routes. His hearty approbation of the little which I have accomplished for the good of the profession, leads me to believe that possibly this paper has not

been written in vain, even tho the N. D. A. ignores my heart rending appeal as he expects it will do. In fact, the mere mention of my name in the same breath with that of John Callahan has made the writing of this paper worth while.

Our pleasure upon this occasion is greatly marred by the knowledge that ill health has prevented Brother Raper's being with us in person, and let us hope that a full recovery is in early store for him, and that many years of usefulness as a Radiodontist and a teacher in Dental Radiology be yet his privilege.

Discussion.

H. B. Tileston, D. D. S., Louisville, Ky.

Dr. Kells needs no compliments. Rather do I congratulate this association upon having this paper read before it by so eminent an authority as Dr. Kells.

It is high time for a vigorous protest against the abuses of which he speaks in no uncertain tones; no one could do this better than he and he has done it in such a masterly and compelling way that those at whom his shafts are aimed, both in the dental and medical professions, must sit up and take notice.

In attempting to discuss Dr. Kells' paper, I find myself so handicapped by complete agreement with all he says that I can scarcely do more than to heartily endorse it.

Heaping upon pulpless teeth the blame for all systemic affections due to infection, from some source not fully determined, and the wholesale extraction of all such teeth on suspicion only, (all too frequently), is undoubtedly a present fad. Many of us have seen fads and fads come, flourish a while and then disappear completely or settle down into a rational practice quit different in its moderation from the fanatical zeal with which it swept along when at its height.

The Century Dictionary defines a "fad" as "an important matter imperfectly understood, taken up, and urged with more zeal than sense."

This definition seems to me to apply with peculiar aptness to the matter under discussion. Indeed this is an important matter and it is imperfectly understood, and we must step warely and with open minds as we seek the truth.

Already there are signs that the fad features that have so long attached to the subject of dental focal infections are on the wane.

The proposal to form one-hundred-per-cent-vital-teeth clubs among dentists, who pledge themselves to extract all pulpless teeth whether guilty or innocent of being foci of infection and without a trial to establish their guilt or innocence, is no longer popular.

Many physicians do consult with dentists before completing their diagnosis in cases where the teeth appear to be a factor, and accept the decision of the dentist, as far as the teeth are concerned, as final.

Even the pathologists, the laboratory diagnosticians who examine an individual from the crown of his head to the soles of his feet, are coming to send their cases to the dentist for examination of the teeth before X-raying them and return the films to him afterwards for his interpretation, recognizing the fact that other things must be taken into consideration besides the mere pictures of the teeth and that only the dentist is capable of giving an intelligent opinion as to their real condition.

Few if any of them however, have quite come to realize that the dentist makes much better skiagraphs of the teeth than can their own expert roentgenologist.

Yes, a good many physicians are meeting these conditions fairly and sensibly; they realize what it means to lose such useful organs as the teeth and recognize the value of the dental surgeon's advice and his right to be consulted. But there are yet many instances, in all large

cities especially, because it is there only that specialists of this kind flourish, of the abuses scored so scathingly and justly by Dr. Kells.

Not long since a lady whose teeth and gums had for many years been under my care and observation, came to see me in great distress. She had been to a noted specialist who in turn had sent her to a roentgenologist and the latter had given her a written report in which he condemned seven teeth to be extracted. Upon the strength of this report the specialist sent her to an exodontist with instructions to remove the seven teeth. Instead of obeying what she considered her orders, the lady came to me, bringing the skiagraphs and the report, to get my opinion first. Upon examining the pictures and the teeth, I found two of them pulpless but not seriously involved, as far as the films showed; the other five out of the seven were vital teeth and two of them were the upper central incisors. Not the slightest indication of disease could I find about the latter, either by study of the skiagraphs or examination of the teeth themselves. You may imagine the relief experienced by the lady when I assured her that she would not have to lose her incisors.

Here was a contemplated crime happily frustrated thru the intelligence of the intended victim. Not a viciously planned crime but a crime nevertheless about to be consummated thru ignorance. The practice giving written reports to patients with recommendations as to treatment cannot be too severely condemned.

Upon another occasion a patient brought some skiagraphs to me for examination which were made by a roentgenologist in another city. The pictures showed only the crowns and about one third of the roots of the teeth. Of course the usual fee had been charged for them.

The interpretation of X-ray films is not an easy task and even when conscientiously performed there is more or less speculation about it. It ought never to be attempted in a detached way but always coincident with an examination of the teeth themselves and their surroundings; it frequently involves tests to determine the vitality of certain teeth. It is rather confusing to find that a tooth with a radioluscent area about the apex of the root responds to the galvanic current test for vitality.

As pointed out by Dr. Kells, every radioluscent area seen in the skiagraphs need not necessarily contain pus or other infected matter. On the other hand the absence of radioluscence in the apical region of teeth known to be pulpless is not conclusive evidence that there is no infection about the roots.

It must be borne in mind that a skiagraph is only a shadow picture fixed upon the sensitized surface of film or plate, the details appearing according to the varying readiness with which the X-ray pass thru the tissues lying in their path. A man walking along the street carrying a cane held directly in front of him and with the sun shining on his back will cast a shadow upon the pavement but no cane will be seen; if he drops his hand holding the cane to his side, its shadow at once appears on the pavement. An abscess sac or granuloma may lie upon the side of a root opposite to that to which the rays are incident and not show in the picture at all or perhaps appear as a minute dark spot at the very apex of the root and be considered insignificant or amenable to treatment. A number of such cases have been proven by extraction after vain attempts to effect a cure of what appeared to be a minor lesion. This is more apt to occur in the upper teeth than in the lower because of the influence of gravity.

One of the uses of the X-ray in practice is in connection with root-canal work.

In the college with which I am connected each senior student is required to carry a case thru in the clinic according to the following technic and to present a thesis upon the case accompanied by the skiagraphs. First an X-ray is taken for the purpose of study and to determine the extent of infection present if any, after which a sterilizing dressing is sealed in and patient dismissed. At the next sitting the canals are cleaned and another X-ray taken with a smooth broach in each canal to determine whether or not they are open to their apices and to ascertain their length. After approved treatment the roots are filled and again rayed.

This is about the procedure which should be followed in practice.

It requires a good deal of courage for a man to X-ray his own finished work after he has done what he considers his very best in a case; not all men have the temerity to do it. I confess that I am lacking in that brand of bravery myself. Oh, of course I don't shirk from the test in all cases, but in some—what's the use in proving by an X-ray picture what I already know.

Again I wish to express my appreciation of Dr. Kell's paper and I hope this body will give him the satisfaction he craves as his crowning accomplishment in a long and useful life by approving and acting upon his seven points as a program.

I move, Mr. Chairman, that the recommendations in Dr. Kell's paper be approved by this section and that they be referred to the Board of Trustees for action.

Howard R. Raper, Indianapolis, Ind.

It is not an unheard-of procedure to discuss the author of a paper instead of the paper itself; it is what I purpose to do now for a few minutes.

I wonder how many dentists know—mighty few I'll wager—that Dr. C. Edmund Kells, Jr., was the first dentist in America, and very likely in the world, to make a dental X-ray picture. It's true, he was. The picture, radiograph rather, was made within one year after the discovery of the X-ray themselves too, if I am not mistaken. Whether it was a good one and showed the ends of the roots or not, I can't say.

Dr. Kells was also the first man to use the "diagnostic wire" in pulp canals, and the first man to make dental stereoscopic radiographs.

Of his many other accomplishments and discoveries I shall not speak here; I discuss only his relationship to radiodontia. I may add, however, that he is an inspirational contributor to dental literature. Ever so often I see, in a dental magazine, a paper by Kells—and I always read it—and thereby pay him the greatest compliment anyone can pay a writer.

I read Kells "stuff", because I never find him trying to "show off"; he does not overwork his medical dictionary trying to impress me. He never offends me with a condescending manner; when he explains, he explains. He does not seem to say between the lines "But of course you can hardly be expected to understand." He recommends instruments and appliances occasionally for this, honestly done, is necessary and a great service, but he does not use himself nor allow himself to be used simply as an "ad" writer for some new dental doodad. He is not a lazy writer; he tells me that writing is not easy for him. This is because he makes it hard for himself that it may be easy for his readers, which is characteristic of really good writers. And always and above all else, of the things I appreciate and admire, there is apparent in all of his written work a clean, fine and simple motive, an honest desire and effort to teach and help. John Callahan's written works were all stamped with the most delightful simplicity and nobility of purpose, and I pay Kells another great

compliment when I say his writings often remind me of Callahan by their sincerity.

And having now told you exactly what I think of Kells' written work, may I not add that I never read an article of his in my life that I did not find something in it with which I disagreed completely, which seemed to me utterly and absolutely wrong. His articles appear to me to be composed of 95% brilliant common sense, and 5% *non compos mentis*.

As an example of the 5%, take the assertion that the X-rays are of little or no value to the peridontist. The peridontists themselves, as far as I know them, seem to think the use of radiographs of great value in their work. Most everybody else I know (except Kells) seems to be of the same opinion, namely, that radiographs are a valuable adjunct in the diagnosis, treatment and prognosis of pyorrhea. The burden of proof that the X-rays are of little or no value to the peridontist then rests with Kells. I simply meet his bare statement with another bare statement which is, that, in my opinion, the X-rays are almost as important to the peridontist as his mouth mirror.

The copy of Dr. Kell's paper now before me, as I write, is really not the paper as Dr. Kells intends to read it to you, but is a collection of elaborated notes, subject, Dr. Kells says, to "revision and re-arrangement." So perhaps parts of my discussion may seem misapplied, for Dr. Kells may elect to change or omit the things I mention.

No one arouses my argumentative tendencies like Kells. His unquestionable sincerity is partly responsible for this; one never wishes to argue with insincerity. Neither does one wish to argue with the dead, or about unimportant things. Kells chooses the most alive problems of the hour, plunges right in where the timid fear to go, and makes an honest and vigorous effort to get at the facts and settle things, "let the chips fall where they may."

Here are some of the things he dives into and tries to settle for us: (1) Shall the general practitioner of dentistry or the specialist do the dental X-ray work? (2) Shall we allow the medical man to make dental diagnoses? (3) When we examine the mouth shall we radiograph all the teeth or just some of the teeth? (4) What shall we do with pulpless teeth? (5) How shall we classify pulpless teeth? And so on and on, incidentally bringing up the subjects of fees, ethics, education of the physician, et cetera. The present "unsettled conditions" due to the war or the League of Nations or whatever they are due to, are about the only things Dr. Kells allows to remain unsettled.

If this were the United States Senate, instead of a meeting of the National Dental Association, there is simply no limit to the time which one might consume discussing the subjects Dr. Kells has put before us.

As I write I have not been informed of any time limit placed on my discussion. I know my discussion will be too long and so I ask the chairman to interrupt me when I have five minutes of grace left. This will give me time for my closing remarks, and if all of the discussion is not read here the entire discussion will be published I suppose in The Journal of the N. D. A. in due time and you may read it there if you happen to be interested.

Dr. Kells compares physicians and their methods of practice to dentists and their methods of practice, considerably to the disadvantage of the dentist. Allow me to compare physicians and dentists, to the disadvantage of the physician. Not that I have any grudge against my brother, the physician, for I have not—I like him—but just to neutralize what Dr. Kells says, and to prove that physicians are at least just as bad as dentists, or, to be more exact, just as human and full of faults.

I have known this to occur repeatedly:

A patient is sent to a dental X-ray specialist, a radiodontist, for a radiograph of the hand or arm or some other part of the body foreign to the teeth. The radiodontist tells the patient and the man referring the case that he can make a good-enough radiograph, but reminds them that he cannot help them much, if any, in the diagnosis, and advises that they go to Dr. so-and-so, a general radiographer. Compare this attitude with the attitude of the physician, the general radiographer, who receives a patient for a radiographic examination of the teeth and mouth. Did you ever hear of such a man admitting his dental limitations and advising that the patient be sent to a radiodontist? If you did, I never did. He takes the patient and the patient's money without the slightest hesitancy, and never intimates that he is not just about as good a dental diagnostician as could be found anywhere. Who then has the keener sense of justice and responsibility in this particular instance, the physician or the dentist?

Again let me insist that I have no quarrel with the physician. Like the dentist, he is the natural outcome of forces over which he has precious little control. A physician is supposed to know more than any human being can possibly know. He tries to live up to his supposed degree of knowledge, and it is simply inevitable that he do a little bluffing, and as he gets older and new things develop, a little more bluffing, until directly he actually doesn't know himself just when he is bluffing and just when he really knows a thing, and so he may have himself fooled into believing he is a dental diagnostician.

Let me show you how queer it may seem when a physician does admit his ignorance and at the same time give a partial answer to Dr. Kells' contention that physicians (surgeons rather) are more careful in their decisions to operate than dentists. A dental salesman installed an X-ray machine in a small town, for a dentist who had purchased the machine jointly with a local physician. When the machine was installed the physician asked the salesman to make a radiograph of the leg of a man who had been shot. The salesman made the radiograph, and when it was finished he held it to the light for the physician's inspection. The physician gazed at it a while and said "I can't tell much about it. What do you think? Should I cut it (meaning the leg) off? I'll do whatever you say." No, Dr. Kells, there is not a vast difference between physicians and dentists and what difference there is, *always* to the discredit of the dentist.

Dr. Kells compares the methods of dealing with the tonsils with the methods of dealing with teeth, and seems to think the tonsil business is handled better. It seems to me they are a good deal alike. If a tonsil exudes pus, why of course it ought to come out, and, if it does not exude pus we are solemnly assured that those which do not exude pus may be daming it back in the lymphatics, that they are therefore the most dangerous kind of tonsils, and should of course come out. With a good many men the method of handling pulpless teeth is quite similar. If a pulpless tooth shows a radioluscent periapical area, why of course it should be extracted, and if it doesn't, why "the pulpless teeth which show no radioluscent areas are the most dangerous kind," they "harbor the most virulent infection," and must come out at once. This sort of reasoning reminds me of the little boy, age about seven, who said to his little brother, age about five, "Willard, if you love me you'll give me some of that candy—and if you don't love me, I'll take it away from you."

Dr. Kells' objections to physicians taking over unto themselves dental diagnosis as their own meets with my unreserved approval; they should have better taste. (Still I must admit some phy-

sicians are no worse dental diagnosticians than some dentists. After all it depends on the man.)

So much for physicians versus dentists. Next, the matter of who shall do radiodontic work, the general practitioner of dentistry or the dental specialist? (We have eliminated the physician, theoretically, and have not even considered the layman.)

Dr. Kells says in substance that the general practitioner of dentistry who does not have his own X-ray machine may enter the race, but he cannot hope to win. Which race is the doctor talking about? The race for dollars? The race of bluff and pretense? Or the race to give the patient the best service? Of course Dr. Kells means the race for giving the patient the best service, and because he refers to this race, his remark that a man must have his own X-ray machine to win his utter nonsense; worse, it's vicious nonsense.

Mr. General Practitioner of Dentistry, I should think you would be dreadfully tired of being told that you *must* have an X-ray machine, that you *must* make your plates by this method, that you *must* have certain scalers, that you *must* do, and be, and buy certain things, or be a "gump." It seems to me the man who tells you you *must* have an X-ray machine is either trying to attend to your business for you or he wants to sell you an X-ray machine. In the final analysis there is but one person to decide whether the general practitioner *must* have his own X-ray machine or not and that is the general practitioner himself.

Along about 1913 everybody said, when the subject was brought up, "The specialist should do the dental X-ray work. The general practitioner has no business trying it." *At this time I advanced the argument that the general practitioner of dentistry should do his own X-ray work.* I spent a very great deal of my time and energy helping dentists get started in the work, and my book still stands as a tangible invitation, and an offer to help.

But things have changed. We have today what we did not used to have, the dental X-ray specialist, the radiodontist. Please understand me, I do not say that the general practitioner *should not* do his own X-ray work if he wishes to, and if he will do it conscientiously. But what I do object to is the assertion that he *must* do it. If he has access to a good radiodontist, he doesn't need to do his own X-ray work, unless he wants to, and his patients will not suffer on this account; in fact it requires no stretch of the imagination to see that they may sometimes be better off. I know dentists who depend on radiodontists for their X-ray work who just simply give as good dental service as dentists can give. And I know other dentists who have installed X-ray machines who are giving as bad service as can possibly be given. Whether a man does his own X-ray work, or has it done for him, does not govern the quality of his service to his patients.

Let me say again, I am in no sense opposed to the general practitioner doing his own X-ray work, *if he will do it well.* What I want to do here is to give protection to our new specialist, the radiodontist, and those dentists who patronize him. There seems to me to be an unfair effort to coerce, bluff, bulldoze the general practitioner into buying an X-ray machine whether he wants to or not. Who is responsible for this propaganda, to induce all dentists to do their own X-ray work? Did the manufacturers have anything to do with it? Did the manufacturers of gas machines have anything to do with the nitrous oxid-oxygen analgesia boom of a few years ago? I ask the questions, I do not answer them.

Let us do a little supposing: Suppose a general practitioner of dentistry is busy, has "all of his time taken," and sends his radiodontic work to a specialist

who does the work as well or better than the dentist could hope to do it himself. Why in the name of common sense should such a dentist install an X-ray machine? Suppose on the other hand, a general practitioner is not busy, but has some extra time on his hands; suppose also he thinks he would like X-ray work and is willing to give the time and study to learn to do it well, I see no reason in the wide world why he should not install a machine. I am rather out of sympathy with the dentist who installs an X-ray machine for mercenary reasons only, or simply because a rival across the street or the hall has one—I understand this has been done.

With modern equipment it is nothing short of down-right "easy" to make a good looking dental radiograph. But a good looking dental radiograph is not necessarily a good diagnostic radiograph. It is often necessary to distort—smear or elongate—the radiographic image to make it show what one wishes to see. A good looking radiograph may fail to show an abscess cavity. A certain type of abscess cavity will show or fail to show, depending on the angle at which the exposure is made. (I haven't the time to elaborate this point. If you are interested read: "Making 'a Spot of Infection' Show Radiographically and Fail to Show, at Will," which will appear soon in Dental Items of Interest.)

Tho it has become comparatively easy to make good looking dental radiographs, the art of interpreting them and making diagnoses *is not easy*. Considering them as interpreters of dental radiographs, dentists, also physicians, fall into three classes. First there are those of the class who know nothing and know they know nothing about it. (As an intensive example for this class take the physician who wanted the salesman to tell him whether to cut off the man's leg or not.) Second, those who know a little and think they know a lot. And third, those who know quite a good deal and realize there is quite a good deal yet to learn. The progressive man, the one who is willing to work and study, passes from the first thru the second into the third class. But some men have been known to stick in the second class.

The following is quoted from an advertisement which recently appeared in several of the prominent dental magazines recently:

"It is an annoyance—an embarrassment, when you have to send your patients to another doctor to have their teeth 'X-rayed.' You can hold their confidence and gain prestige by doing that work yourself."

I quote now from a letter which the writer sent to the manufacturer responsible for the above quoted statement:

"I too, have made mistakes, so I feel, on that account, freer to direct your attention to one of yours.

"I refer to the advertisement which I enclose.

"If, as you say, it is 'an annoyance' and 'an ambarrassment' to a dentist to have a specialist make radiodontic examinations of his patients, then there must be something the matter with the dentist and his work, or the specialist and his work, or both, I know it is not always 'an annoyance' and 'an embarrassment', that it is sometimes a 'convenience' and a *relief* to have another man share the responsibility in serious cases. Suppose you, or your wife, had to lose all your teeth, would you want it done on *one* man's opinion, or would you rather have the opinion of *two* men, one an expert of wide experience in such matters?

"Your advertisement continues, 'You (the dentist) can hold their (patients') confidence and gain prestige by doing the work.' * * * *But how about the patient?* Must the patient sacrifice his right to the best service so the dentist may gain prestige? Should the dentist resort to trickery to get confidence he does not deserve?

"Whether a dentist should do his own X-ray work or not depends on many things: Whether he wants to or not. Whether he will give the matter the thought and time to become really proficient or not. Whether he has access to a capable specialist or not. Whether he is already busy or not. And so on.

"In the second edition of my book, I enumerate 41 mistakes in radiodontic interpretation and methods of practice" (By adding mistakes which are described in the book but not mentioned in the formal list of 41, and some new ones I have since encountered, the list in my note book now stands at over seventy.) Specialists are less likely to make mistakes. The specialist stands for the highest quality of service, so when you disparage him you hurt the ultimate consumer —the patient.

"* * * I have been an ardent advocate of the idea that the dentist should do his own X-ray work. But so often he does it so badly. True, he sometimes does it excellently. When all is said, is this not true: The work should be done by *both* general practitioners of dentistry and specialists, depending on the circumstances and the men. Even the dentist who owns his own X-ray machine should, on occasion, seek the assistance of the specialist, just as a dentist may do some of his own extraction and refer the balance to a specialist.

"Won't you please quit such advertising, as this kind I object to? You do not need to care whether you hurt specialists or not, but certainly you do not want to be instrumental in lowering the class of the service received by *patients*. You do not want to advise a * * * * man to do any operation simply to 'gain prestige.'

"* * * * Granting that 'annoyance' and 'embarrassment' do occur, let us see why. Immediately let me concede that a tactless, no-brain specialist may cause a dentist annoyance and embarrassment. On the other hand the annoyance and embarrassment may arise from the fact that the dentist wants to 'put something over on the patient.' Where both dentist and specialist are honest, capable men there is no annoyance or embarrassment; in fact the specialist very often saves the dentist embarrassment when patients are inclined to blame dentists unfairly and expect them to accomplish the impossible."

I quote from the reply I received to my outburst:

"We have very carefully considered your letter of June 30th and are strongly inclined to think that our advertisements should not touch upon the question of whether or not the X-ray work should be done by a general practitioner or a specialist. There are arguments on both sides and, in our opinion, we should keep out of them."

And this manufacturer has kept his work absolutely.

In passing let me direct your attention to this fact: For the first time in the history of dentistry, *what a dentist may do is recognized as being of sufficient importance to justify a consultation.*

Concluding this subject let me ask: If Dr. Kells really believes that every dentist should do his own X-ray work, why has he recently limited his practice to *radiodontia* and minor oral surgery? The truth is, I think, Dr. Kells doesn't believe that every dentist should do his own radiodontic work. Judging from his actions, and disregarding his words, he believes that the dental specialist devoting his efforts to "X-ray diagnosis and consultations" is entitled to existence, and believing this, he must of necessity believe that some dentists need not or should not do their own radiodontic work.

I feel I have already taken too much of your time, tho there are many other things in Dr. Kells' paper with which I would like to agree and disagree and elaborate upon.

I take it from Dr. Kells' remarks, that he is opposed to the practice of radiographing all the teeth in all cases

of suspected metastatic infection. My objection to the work of the laboratories is not so much due to the fact that they radiograph all of the teeth, as that they handle all cases in the same way almost regardless of the case and that, having made a "set of films" they stop there no matter what the indications for verification make-overs or further examination. Dr. Kells, isn't it better for the patient, that a man with poor judgement should radiograph all of the teeth rather than attempt to judge which should be radiographed and which need not be? There is much more to be said for and against our present radiodontic practices, but I haven't the time to say it. The most important thing in this connection is, I think, the disastrous "competition for cheapness." Because it is too lengthy a subject to discuss here, won't you forgive me if I refer you to another of my own articles which appears in the October Oral Hygiene and ask you to read as much of it as you can stand?

The foregoing has been written in haste. I regret I have not had time to make it shorter and more to the point. Also, owing to my haste, I have no doubt said things I should have said differently or left unsaid.

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In conclusion let's take an invoice: Supporting Dr. Kells' main contention let me ask, *Do we know enough about metastatic infection to justify the removal of all pulpless teeth?* I think the answer is, *We do not.* And yet someone has said "A pulpless tooth is simply a delayed extraction." I believe in the delay, we do not know enough to go ahead. But all children of Eve get sick sooner or later, and if there are pulpless teeth in the mouth when this sickness comes, almost regardless of the nature of the illness, such teeth become a source of deep concern and worryment. For no matter how innocent they may be, their innocence cannot be satisfactorily proved, and so while they remain in the mouth and *the patient remains ill* one can scarcely do otherwise than look upon them with some suspicion and a consequent most distressing uneasiness.

Isn't it true that the only important things we do know for sure and certain are these: (1) We know that almost all periapical infection follows toothache. (2) We know that almost all toothache can be prevented by filling and refilling carious cavities just as soon as they occur. (3) We must know then, if we can put one and one together and make two, that it is our duty to prevent toothache. It isn't much that we know for sure, is it? But it is enough so that if we make practical use of the knowledge we can do a great amount of good to suffering humanity.

In 1915, at the Panama Pacific Congress, I tried to convince the N. D. A. that it was time for it to say something to the public. It is an odd fact that he N. D. A. never has said a word to the public. If the Association had acted upon my request then and adopted a slogan or message of warning against toothache, and had then promoted the publicity of such a message, just think of the tremendous good that would have accrued by now. The majority of people would know that toothache is preventable and would be cooperating with their dentists to prevent it. But instead, here we are just about where we were four years ago, like men in a leaking boat, frantically baling and steadfastly refusing to make any effort to stop up the leaks.

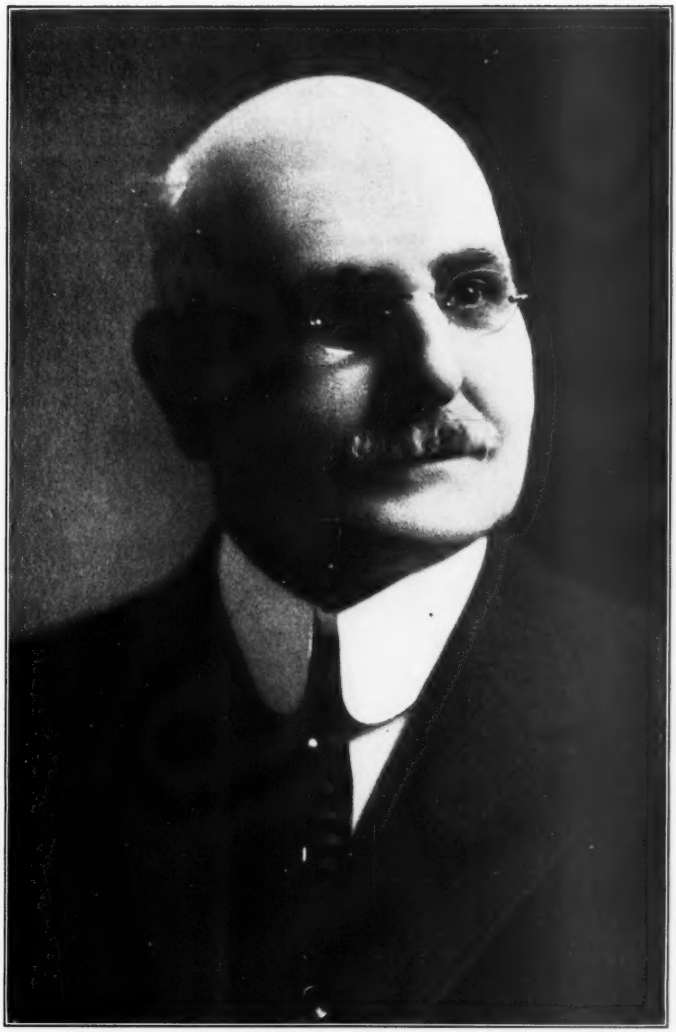
I do not reproach the N. D. A. for its lack of action. If I blame anything, it is my own lack of strength to push the thing. Since my recommendation of 1915 I have, by proxy, brought the matter to the attention of the Board of Trustees, on two occasions (the last time 1917) in an effort to persuade them to endorse the plan and bring it before a general assembly for a vote. Some objection was raised by the Board to the

exact wording of the slogan suggested. Accordingly it has been changed, not in essential meaning, but the objections have been overcome, I believe.

The message I want the N. D. A. to send to the people of the world is this: "YOU MUSTN'T LET YOUR TEETH AKE. LEARN WHY." Signed: The National Dental Association. And it should not only be *sent,* but we should see to it that it is *delivered,* that everybody "gets it." And until this is done, or some similar thing is done, the N. D. A. has not discharged its full duty to the public. Or at least that is my opinion. (Suggestions of ways to promote the publicity of such a slogan have already been presented to the Board of Trustees.)

Dr. Kells sets forth certain things and asks the N. D. A. to go on record as approving them. I approve them, Dr. Kells, and certainly hope you have better luck gaining the approval of the N. D. A. than I have had in my effort to get approval of my slogan and schemes for its publicity. But, my dear Kells, I do not like to hear you say that you will consider that your life "has not been spent in vain" if you can gain the N. D. A's approval of your ideas. For, may I not reason inversely from this, that, if your ideas are not approved you will believe that your life *has* been spent in vain. The worth of your life, my dear friend, does not depend on any such uncertain thing as the action of the N. D. A. Please do not attempt to determine this matter for yourself. Let me dicide for you. And I decide forthwith that your life has most emphatically not been spent in vain. Any man who makes his fellow man think does not live in vain.

If I have understood Dr. Kells, the main object of his present paper is to save teeth, to lessen the wholesale extraction now raging over the country. It would be a splendid thing to accomplish, I think, but allow me to point out that there is one thing of more importance. The teeth Dr. Kells is trying to save for humanity are pulpless. The more important thing is to save teeth with vital pulps in them, teeth which today are not even decayed, but which are destined to decay, and neglect until the pulp becomes involved, unless we take some strenuous steps to prevent it.



HENRY WILLIAM MORGAN, M.D., D.D.S.
1853—1920.

DISEASES OF THE MAXILLARY SINUS OR ANTRUM OF HIGHMORE.

By C. H. Oakman, M. D., D. D. S., Detroit, Mich.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

Etiology.

DISEASES of the antrum occur as a result of an extension of infection from adjacent structures, frequently from diseased teeth or from the nose and adjacent sinuses. Ballenger states that the causative factors in diseases of the antrum are about equally divided between the nose and the teeth. Marshall states that alveolar abscess is the most common cause in producing suppurative conditions of the antrum. Ballenger states that an obstructive lesion may be a deflection of the nasal septum. An enlarged bulla ethmoidalis or cells in the uncinate process, or the median wall of the infundibulum. Acute rhinitis, cystic formations in the mucous glands, neoplasms within the antrum, erruptive fevers or infections carried in the blood, and from accessory sinuses and occlusion of the ostium maxillare. It is the writer's belief that fully 90% of all the cases that come into his hands are of dental origin.

Pathology.

The antrum is the largest of all the sinuses, and it is also the most frequently diseased, as both the nose and the teeth are constant factors in the causation of antral disease. All cases of nasal catarrh should be considered as suspicious indications of antral empyema. Loeb gives interesting information in his book as to size and capacity of the antrum, showing wide variations in dimensions.

Empyema of the antrum may be the result of foreign bodies, such as the presence of teeth and roots of teeth which have been forced into the antrum in attempts to extract same. It sometimes follows cases of hyperthopic rhinitis and influenza. Infection of any of the accessory sinuses may extend to the antrum, from the frontal sinuses via the infundibulum and ostium maxillare. Cryer first pointed out that direct communication frequently was found between the frontal sinus and the antrum.

Albumen has frequently been found in the urine when individuals were afflicted with chronic antral empyema, and after resolution had taken place within the antrum, the albumen disappeared and did not return, showing that the parenchyma or the functioning part of the kidney was not premanently involved, the albumen being only transitory, and that the albumenuria was due to toxic material absorbed from the antrum.

Cryer mentions a case where the antrum was so small that it was difficult to tell when he had entered it. The writer had a similar case in which the antral walls were so nearly approximated that there was little more than a slit for an antrum, the disease of which, however, was sufficient to cause the

patient severe illness for a number of years.

The complications of antral empyema are:

1. Arthritis.
2. Heart Lesions.
3. Sclerosis.
4. Corneal Ulcer.
5. Kidney Infection.
6. Gall Bladder Infection.
7. Neuritis.
8. Anemia.
9. Indigestion.
10. Septicemia.
11. Ulcer of the Stomach.
12. Intestinal Disturbances.
13. Chronic Headache.
14. Foetid Breath.
15. Anterio Sclerosis.

Many other complications could be mentioned.

Pathology.

The chronic forms of sinus empyema are frequently associated with *pharyngeal* disturbances, resulting in a granular or hyperplastic condition. *Grunwald* states that all nasal polypi are practically pathogomonic of accessory sinus disease, ethmoids especially.

Uffenorde asserts that they have absolutely no relation to it. *Kaufmann* states that in many cases empyema of the maxillary sinus was the only cause for the polyp formation.

Heymann is of a different opinion and states that the secretion causes an irritation to the smooth mucosa which results in the formation of inflammatory papules which is followed by hyperplasia and the resultant oedema causes the formation of small polypi.

Vowge states that the glands undergo cystic degeneration by obstruction of the ducts, thereby forming polypi.

Dentigerous Cyst. These are caused by disturbance in dentition. Those due to unerupted teeth and those due to inflammatory changes in the peridental membrane of the tooth frequently following the death of the tooth pulp.

Skillern states that one symptom indirectly caused by the secretion when present, is almost pathognomonic of sinus disease, is this subjective appreciation of an offensive odor in the nose. This is usually intensified by sudden sharp inspiration thru the nostrils. The cause of the condition is due to the putrefaction of the secretion of saprophytic micro-organisms.

Tilley appears to place the teeth as the causative factor in antral disease at one hundred per cent, Lermoyez more than fifty per cent, Ballenger fifty per cent and Luc fifty per cent. Among those who hold the opposite opinion may be mentioned, Cryer twenty-nine per cent, Turner thirty per cent, Richards twenty-five per cent to thirty per cent, Piffl twenty-six per cent, Hajek eight per cent.

Diagnosis.

A history should be secured of all cases:

Objective Symptoms.
Subjective Symptoms.
Transillumination.
X-ray Films.
Antero-Posterio Plates of the Sinuses.
Urine Examinations.
Differential Blood Count.

The last two are not aids in diagnosis, but are of value, for we often find albumen in the urine when there has been a chronic empyema of the antrum. A differential blood count is of value for there are many cases of secondary anemias, due wholly to pus absorption from antral contents.

In making a diagnosis, it must be borne in mind that there are many border-line cases, so it behooves the operator not to act too hastily in opening the sinus. There are many cases in which all the cardinal symptoms are lacking, such as pus from the nose and postnares, occipital and frontal pains, pain or tenderness in the region of the antrum. Even with these symptoms

absent, one is not justified in saying there is no antral involvement. Opening a healthy antrum by mistake may be the means of infecting the same, thereby causing considerable pain and inconvenience to the patient. It has often been said that an infected antrum was like the poor, "The Poor Ye Have With Ye Alway." That, of course is only relatively true. The cases that are difficult to cure are those in which the periosteum of the antrum is partly destroyed or raised from the bone, in which case the bacteria attacks the underlying structure. In all such cases, a large opening should be made, so as to be able to feel all parts of the antrum with the finger; a suitable electric lamp can be placed within the antrum so as to properly examine the interior. In some cases the naso-antral wall will be involved and must be removed, together with the turbinated bones. The oral surgeon takes pride in the fact that he does not make an opening into the nasal wall, unless it be diseased. Brophy states that he can find no justification in opening thru a healthy nasal wall in order to drain the antrum. In this, the writer heartily agrees with him. If the naso-antral wall be removed, it leaves a large opening into the antrum and is subject to reinfection from the nose. I can see no reason why we should destroy the anatomical structure of the nose in order to cure antral empyema. Of course, this does not apply to cases of cancer or where the nasal wall is diseased thru necrosis. The rhinologist often opens the antrum thru the nasal wall in order to drain the antrum, and this frequently gives immediate relief in acute cases, but it is only temporizing when done in chronic cases. If the antrum is filled with polypoid tissue, it cannot be removed thru the nose without extensive destruction of the nasal wall. There are two methods that oral surgeons generally follow which the writer begs leave to classify for convenience as the high or low operation—the high operation is made in the cuspid fossa, and the low operation thru the floor of the antrum. It is imperative to know before the high operation is done that the floor of the antrum is not diseased. Otherwise, the operation will prove a failure thru constant reinfection.

I have seen cases where the patients stated that they had pains in the right antral region, and after making a diagnosis of antrum disease of the opposite antrum, and operating on same, the pains ceased, showing that we must, at times, be guided by other than the subjective symptoms, altho I always lend an attentive ear to them, which in many cases, are important. In cases of sinusitis, there is often no pain in the antral region; the pain is often referred to supra-orbital, frontal and occipital regions, and the primary factor in the case will be that of the antrum. I have seen very few cases of antral disease wherein trauma was a factor, unless the teeth have been injured. In other cases, a diagnosis can frequently be made, however, before the patient has gotten fairly started on the history of the case. One can be reasonably sure of his diagnosis, but it would be unscientific and unpardonable to operate, should there be error, without using every measure to obtain a proper diagnosis.

There are no doubt thousands of cases of antral disease in every large city, and when the antrum is mentioned in this regard, it also applies to all the sinuses. But, as dentists, and oral surgeons, the antrum is the sinus we are called upon to treat, and we should be ever watchful and consider this sinus in every-day practice. The dentist who diagnoses antral infection will have a grateful patient, whether or not he does more. The enumerable cases which have gone on for five, ten, and even twenty years without being diagnosed, have no doubt been the cause of many semi-invalids, invalids, and even deaths. The writer

has seen many cases of chronic invalidism due wholly to infection of the antrum, for when the antrum was cured, the patient recovered. If the physician and dentist would pay more attention to focal infections, many of these antral cases would be discovered. If more consultations were held where patients were ill, and where the symptoms are not marked, much good would come of it. Physicians send patients to the dentists for examination of their teeth. The dental examination is often too hastily made, and in a few moments, patients are quickly informed that there is nothing wrong with their teeth. A proper diagnosis of the teeth cannot be made without the use of the X-ray, and as most of the antral conditions which we are called upon to treat arise from the teeth, it behooves us not to neglect anything that will aid in diagnosis. Surprises in this respect are constantly cropping out. Proper interpretation of the radiograms is imperative in all cases. One or two radiograms of the teeth and jaws are not sufficient to make a diagnosis. Sufficient rays of every tooth should be taken to insure proper diagnosis. The writer is often asked to make a diagnosis of the teeth from one film. This is an impossibility.

Exophthalmia is a symptom of antral involvement, but does not occur often except in cases where neoplasms or tumors are the exciting cause. Oedema of the eyelids and adjacent parts may lead one to believe that there is an exophthalmia, when in reality, there is no protrusion of the eyeball. Mistakes are sometimes made in diagnosis of borderline cases, the disease escaping nearly all means of diagnosis. I must reiterate that *chronic migraine is an important symptom in antral disease.*

Pain is severe in cases where there is an acute exacerbation of a chronic condition. Pain or headache may be the only symptom, and is often endured for years. The bucco-antral wall may be tender on pressure, the sight may be impaired or partly or wholly destroyed by extension. The most common symptom is a discharge of pus from the nose or naso-pharynx. A history of awakening in the morning with a disagreeable taste and frequent expectoration of pus, accompanied by nausea, which lessens during the day, no doubt, due to the upright position when walking or working. In some cases, the outer walls are so thin that they crackle like parchment under pressure. In many cases, there are no symptoms either subjective or objective, except headache. In chronic cases, the middle turbinate will be found inflamed and edematous and often ulcerated. Relief is often obtained by lying on the opposite side. Headaches are sometimes caused by the middle turbinate making pressure upon the nasal septum.

Cases in which blocking of the infra-orbital nerve is restored to, either extra-orally or intraorally, if the needle enters what appears to be the infraorbital foramen too readily, it is well to partly withdraw the needle and make another thrust a short distance from the first thrust. This should be repeated several times. Should the needle penetrate the new areas readily, it is then apparent that it is not the foramen that was entered, but that the bone was diseased. In that case, the high operation is imperative. If disease is found at the floor of the antrum, then both wounds should be connected if there be much disease of the bone. As a rule, the tissue in the high operation should be immediately sutured and the drainage maintained from the antral floor.

The supporting structure of the teeth should be carefully examined in making a diagnosis. The X-ray may fail to demonstrate certain features, and it is therefore imperative that a careful clinical examination be made in connection with the radiograph findings. The vitality of the teeth should be ascer-

tained. If there is no sensation when heat is applied, to apparently healthy teeth, it is quite evident that there may be a diseased pulp which should receive further investigation.

Differential Diagnosis.

At first sight one is liable to be mislead in diagnosis between malignant neoplasms and dentigerous cysts. Malignant conditions are generally followed by immediate loosening of the teeth, bulging of antral walls, new growth in nose, and foetid secretions with necrosis of the buccal and lingual walls, followed by metastatic glandular involvement.

In empyema, most of these symptoms are absent unless there be necrosis of the bone, which is accompanied with foetid secretions.

Local Anesthesia.

It is the writer's choice to operate under local anesthesia, on account of the greater facilities offered to the surgeon in control of the blood and secretions by the patient, as well as their co-operation, which is very important. If the preliminary anesthesia is carried out properly, the operation can be done with little or no pain. This method has frequently been used in operations on highly n u-rotic patients with excellent results. It has been my practice for years to prescribe fifteen grains of chlorotone one hour before operation, followed by a hot drink of coffee, tea or milk which facilitates the absorption of the drug. My preference is a solution of cocaine, one per cent, chlorotone three and one-half grains to the ounce.

Chlorotone is a local anesthetic, hypnotic and antiseptic. It is not an antidote for cocaine, but when made into a solution, it acts in the opposite direction to cocaine and thereby eliminates the toxic effects of the drug. The results obtained from this combination are all that could be desired. It prevents nausea and vomiting, and is a time-saver to the operator and a comfort to the patient, thereby allowing very nervous patients to undergo operations under local anesthesia with very little inconvenience. Have used it successfully on soldiers who were suffering from shell shock; also on men who had "smokers' heart," and on other neurotics with equally good success. Chlorotone, fifteen grains, administered one hour before operation where nitrous oxide is used or in combination with gas and oxygen, anesthetizes patients in less time, and they remain quiet during the operation, as the anesthesia is more complete.

Operation.

Before operating on the antrum, the mouth should be in as hygienic condition as possible. If pyorrhea is present, it should be treated, badly carious teeth and roots should be removed, as well as elimination of all other foci of infection within the mouth. The above would be good practice for the nose and throat surgeons to follow as a regular routine. In the performance of either a high or low operation, that is, in the cuspid fossa or in the floor of the antrum, it should be borne in mind that the naso-antral wall be not accidently injured. In many cases, this wall extends into the antrum. Years ago, it was taught to cut on a line with the inner canthus of the eye. This I have found not to be good practice. Instead the writer would place the bur or chisel more on a line with the outer border of the eyeball, thereby avoiding nasal wall. Care should be taken not to injure the frail nasal wall with the curette; also the infraorbital nerve which enters the antrum just below the floor of orbit. I prefer the use of a half-round gouge—when properly placed, a few sharp blows of the mallet will make a nearly half-round orifice, and this can be readily extended anteriorly or posteriorly for the acquired amount. Large surgical burs, not too coarse, are used to smooth all rough parts, which will facilitate the dressing of the wound without much pain to the

patient, which, of course, is very important. After operation on the antrum, and elimination of pus, olfaction and taste are often improved and sometimes cured. Care should be taken not to injure the parotid gland in making extensive incisions when considerable bone is to be removed. The gland may drop down and extend into the mouth, and is likely to become infected and sloughing of the gland may follow. Should this accident occur, the parts should be treated antiseptically, the gland forced back into place, and the overlying tissue immediately sutured, observed and treated daily until the wound is healed. After the antrum has been well opened up, it is necessary to control hemorrhage either by sponges wrung out of hot water or by the application of adrenalin in order to make a thoro inspection. Remove tissue which shows great degeneration, polypoid or otherwise. It is a point of fine distinction to remove just enough of the mucosa, and this cannot be done without proper vision of the interior of the sinus. A suitable electric lamp can be inserted into the antrum or a reflected light can be used.

It is surprising, in some cases, with what rapidity the fibrous tissue is regenerated within the antrum, following radical operation.

When the palatal bone is necrotic with antral involvement, syphilis excluded, I do not deem it wise to incise the soft tissues of the palate, but instead, to operate from above, downward on the buccal surface, when the necrotic bone of palate can be readily reached by curette and removed without incising palate. By operating in this manner the topography of the palate is more nearly maintained, which is of considerable consequence. Cooperation with a good rhinologist is often of great value, for after the antrum is cured, the middle turbinate is sometimes enlarged, making pressure on the nasal septum, at the same time occluding the osteum.

The youngest patient on whom I have operated for antral empyema was eighteen months of age, and the oldest seventy-eight years.

Non-areation.

After antrum is operated on and cured, and the wound entirely closed, some patients complain of a peculiar sensation and insist that many of the former symptoms are still present, having had no trouble after operation until the wound closed. When the antrum was again opened and air admitted to the sinus, the patient felt very comfortable. In some of the cases that were re-opened, after resolution had taken place, it showed that the antrum was free from pus or other pathological conditions.

Treatment.

In the treatment of the maxillary sinus, it is always well to take into consideration the accessory sinuses, as they are so intimately related with each other that the etiology and treatment of diseases of any of them must be governed more or less by the conditions found in adjacent sinuses. When cases present themselves for examination, it is well to determine, if possible, whether or not the primary cause is of dental origin.

Menzell says it is impossible to force liquid from the antrum into the frontal sinuses. This I do not believe to be true if 56% of the antral cases, as Schaffer says, have communication with the frontal sinuses. It is fair to presume that it is very likely that the accessory sinuses, including the frontal sinuses, can become involved by forcing infection into these areas. We well know that the opposite antrum can become infected from its fellow, for it has often been seen when douching the antrum, either thru a perforated septum or accessory sinus, or via the posterior nares, fluid will flow from both nares, so it behooves us not to use too much force, unless there be a large opening

whereby the fluids can readily make their escape. In the treatment of the antrum, no drug of an irritating nature should be employed in antral lavage. The best results, in the writer's opinion, are obtained by the use of a physiological salt solution or boric acid. If Dakin's solution is used, it must necessarily be made considerably less than 1%. Irritating agents cause an excessive discharge of pus from the antrum. All solutions should be used warm.

Acute Sinusitis.

In acute sinusitis, the pain is generally severe. There may be a feeling of fullness on the affected side, a dull headache with pains in the supraorbital, infraorbital, frontal and occipital regions. Pressure on the eyeball will often reveal tenderness. The unilateral discharge from the nose and pharynx is odoriferous and an offensive symptom.

Chronic Maxillary Sinusitis.

In these cases, the pain is not so severe. There is often a history of previous attacks. Distension of the buccal and palatal walls is frequently seen due to pressure caused by retention of fluids, and the long duration of the disease affecting the sinus walls. Altho the discharge is generally unilateral, there are many bilateral cases which are frequently not diagnosed until the condition becomes marked. The osteum is often occluded by polypi from within the sinus as well as polypi within the nose. Necrosis of the buccal and palatal walls often follow long, continued antral infection.

Prognosis.

The prognosis in antral cases is generally good, altho there are cases recorded where meningitis followed operations on the antrum. In my experience, I have found tuberculosis of the antrum of very infrequent occurrence.

Case Histories.

Milton J., aged seventeen years, was sent to me from one of the clinics. He had a brawny swelling on the left cheek with several sinuses opening externally. This condition was of several months' duration; his teeth on the affected side were badly broken down, the gums were boggy and loose at the crevices of the teeth with pus oozing therefrom. It was found that the bone was necrotic; the pus was drained for a few days after removal of all the teeth on the affected side up to the cuspid. A radical operation was done on the antrum, when it was found that there was a septum or attic just below the floor of the orbit. An external, transverse incision of about an inch and a quarter was made a short distance below the floor of the orbit, the infraorbital nerve was put on the stretch and resected. The bone was also necrotic in this area. Thru this external opening, a sequestrum was removed and the wound allowed to granulate. The borders of the wound were smooth by a Ronguer forceps, and the external wound and antrum packed with gauze and tincture benzoin for two days, and repeated three or four times at two-day intervals. The patient made a complete recovery. Local anesthesia was employed.

Figure 1.

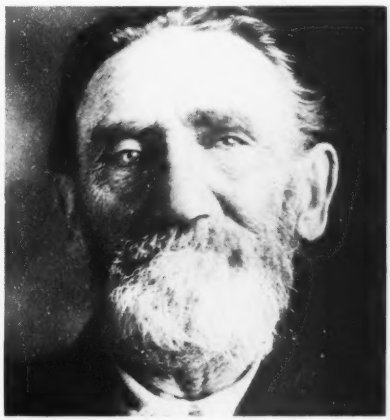
Mr. J.

Mr. G. U., aged seventy-eight years, occupation, farmer, called on the writer the latter part of June, 1919. An examination of the upper, left jaw revealed the fact that he had a tumor in the left cheek the size of a hen's egg which distorted his face. Examination of the upper, left jaw showed that the bone and soft tissues were much involved. A local anesthetic was injected into the gums in the region of the median line. Only two molars and cuspid teeth were present in the upper, left jaw. The gum tissue was greatly thickened, which made it easy to remove a good sized specimen, which proved it to be a large, round-celled sarcoma. Most of the upper, left jaw was removed intraorally under ether anesthesia. The jaw was resected from the median line upward to the floor of the orbit, leaving a portion of bone at the heel of the jaw. All of the nasal wall and the middle and inferior turbinates were removed; also a large cystic tumor on the nasal septum. In order to avoid recurrence, and to effect a cure, it was evident that all diseased parts should be removed as well as some of the healthy tissue. The cavity was packed with gauze and balsam Peru and allowed to remain three days, after which it was replaced every two days while the patient was in the hospital, which was ten days. After this, the wound was allowed to granulate. Exuberant granulations were removed from time to time, the parts being treated with tincture of iodin and sulphate of copper.

Figure 2.

Mr. G. U.

Figure 3.



Mr. G. U.

There was considerable hemorrhage during the operation. The tumor in the cheek was readily removed. The most interesting feature of this case was the rapid repair that has taken place, as you will observe from the slide. He is now improving rapidly in his speech, which, at first, was greatly impaired. The superior turbinated bone was left intact. You will notice that there is scarcely any abnormality in facial contour. He is now quite vigorous and wants to return to the farm. His left eye and lachrymal duct were congested for some time.

Mrs. F., aged twenty-six years, gave a history of a tumor in her right cheek. She said this swelling had been present as long as she could remember, and that

her physician, ten years previously, had advised against on operation. Saw the patient at the age of twenty-three, but as she intended to be married, she wished to defer the operation for a time. She deferred the operation for three years, and at the age of twenty-six years, an incision was made from medium line to the heel of the upper jaw, about a half inch below the fold of the cheek, and the parts retracted. The tumor proved difficult to remove, but on account of its nature, concluded that a thru operation was imperative. There has been no recurrence after five years. It was considerable time before the swelling left the cheek. Today there is no evidence of her former trouble.

Figure 4.

Mrs. F.

Figure 5.

Mrs. F.

Figure 6.

Mrs. F.

Without thoro removal, the tumor is very likely to recur.

Mrs. R., aged forty years. First saw this patient in consultation with her physician. Her case resembled erysipelas. The writer had had cases quite similar to this one, and felt sure it was one of antral empyema. The oedema was so extensive that the eyelids could not be separated. Her pain was very severe, and it was thought best to open the antrum in the cuspid fossa, which was done under gas anesthesia. Considerable pus was emited, which lessened the tension, and with an ice bag applied to the cheek, and a hypodermic of morphine one quarter grain, she was able to

sleep a good portion of the night. Previously, she had not slept for several nights. Forty-eight hours later, a radical operation was done at the hospital under ether anesthesia, removing most of the floor of the antrum and the whole of the antral mucosa. The outer plate of the bone was found to be necrotic, involving quite a portion of the maxillary bone. The necrotic area was removed, and in about a week, when the

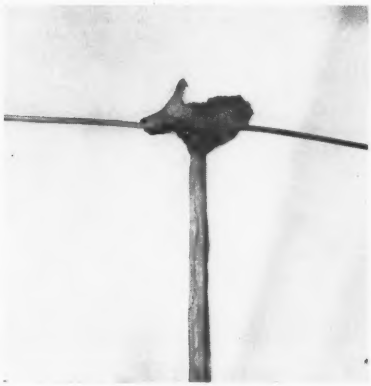
Figure 7.

Mrs. R.

patient was almost ready to leave the hospital, the following morning found her face nearly as badly swollen as before. There appeared to be pus forming in the region of the infra-orbital nerve. An external, transverse incision about an inch and a half was made just below the lower eyelid. Considerable pus gushed out. On exploration, bony crepitus was felt, and a sequestrum removed that comprised a fragrant of bone including the infraorbital foramen and a portion from the floor of the orbit, after which the patient made a rapid recovery. This cut will be found in Brophy's Surgery, just as the artist made it while the patient was in the hospital.

Mr. M., aged fifty-four years, occupation watchman, gave a history of not feeling well for some months, but was able to work. After examination of the mouth and jaws, it was evident that he had a severe case of bilateral antral involvement in conjunction with necrosis. All of the upper teeth were more or less loose, he was emaciated, had a poor appetite, his color was bad and he plainly

Figure 8.

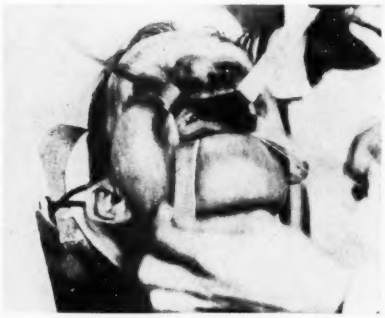


Mrs. R.

showed that he was suffering from toxemia due to pus absorption. His temperature was not high. On the account of the great amount of pus about all parts of the upper jaw, hesitated to use local anesthesia, neither did I wish to use profound narcosis, as I feared post-operative complications (septic pneumonia) might arise, and the possibility of an embolus. The parts were not sensitive, so concluded to go as far as possible without any form of anesthesia. Several teeth were extracted without any inconvenience to the patient. Examination showed that the bone was necrotic and that much of the upper jaw would have to be removed. Several sequestra were removed, and the field was syringed

thoroly with physiological saline solution and the parts dried and painted with tincture of iodin. The second day, all the teeth on the opposite side were removed except the second and third molars, which were somewhat loose. The writer did not wish to extract these teeth if possible, thinking they might become more secure after removal of the diseased parts, at the same time, bearing in mind that if I had to do a radical operation, it was evident that an appli-

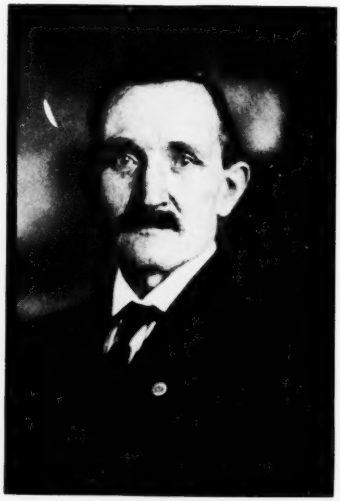
Figure 9.



Mr. M.

ance could not be retained in the mouth if all the teeth were extracted, his speech would be materially affected, and that he would be greatly distressed by food getting up into his nose as well as both antra. Two days later, was able to remove part of the upper jaw, including a portion of the left palatal bone and the bone below the orbit, approximating the nasal bone. As he stood the operation well, three days later, concluded to hasten things a little, thinking that he might realize that he was having something done and discontinue, so all the bone below the nose was removed. This increased the size of the cavity immensely. The patient continued to endure the operations well, but was a little weak from loss of blood, so was given ten days rest in bed, but was treated several times at his home. On the eleventh day, he came to the office, when I removed about one-third of the opposite jaw, taking care not to injure the second and third molars. However, believed that the teeth had a poor chance of ever being of any value. Looking directly into the patient's mouth, the wound looked much as in Partsch's

Figure 10.

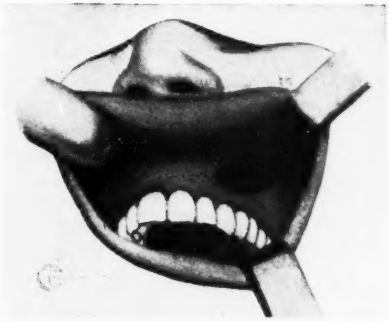


Mr. M.

operation, but in this case, part of the left nasal wall was removed; also the middle and inferior turbinates. About this time, the patient began to realize that he was having something done, as sensation was beginning to return in the tissue. Six weeks later, the surrounding tissue began to take on a life-like appearance, and the writer concluded to endeavor to fit an appliance, which was no easy matter on the account of undercuts which made the withdrawing of the modeling compound somewhat distorted. With the aid of one of my assistants, we constructed an obturator which was a most unusual looking appliance, but it

was applicable to the case. The two molars began to tighten up, and by the use of heavy, gold clasps, he was able to wear the appliance and soon began to

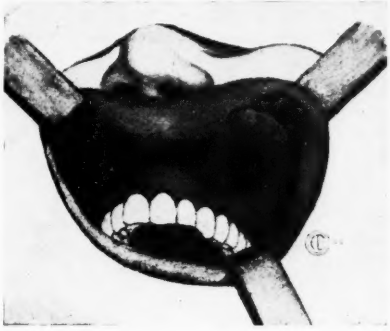
Figure 11.



Large Antral Opening.

improve in his speech. In three months' time, he was able to resume his work. A short time later, a new appliance was made which he wore with a great deal of satisfaction. The only time an anesthe-

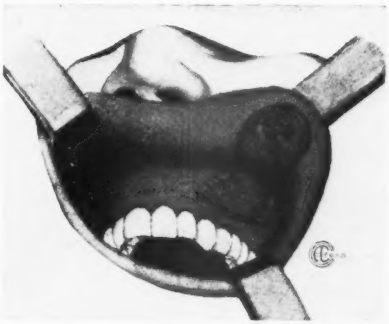
Figure 12.



Large Antral Opening.

tic was used was when the impressions were taken and then topically. Following the periods of operation, he took considerable quinine and some whiskey. The most nutritious diet that he could take was given him. He made a splendid recovery with scarcely any facial change. The obturator was so constructed that it took care of facial defects. The results

Figure 13.



Large Antral Opening.

Figure 14.

Herb-Bilateral Antral Empyema.

of this operation have often made me wonder what results might have been obtained if profound anesthesia were used. This, I believe, is in accordance

with Crile's idea of anocia association, in which I firmly believe, and to whom the surgeons of the world owe much.

Showing large opening in bucco-antral wall. The opening was made so low that the large orifice never closed. Three attempts were made by a surgeon to close the wound, but each operation was a failure. This opening caused the patient much annoyance. He was sent to the writer to see if anything could be done to remedy the condition.

Figure 15.

Mrs. L.

Concluded to take a flap from the cheek, and by inverting same on a pedicle, the flap was drawn down thru an opening made by transverse incision near the cervical margin of the gum and sutured. The sides of the flap were drawn thru the lateral incisions and sutured. Four small incisions are made at the corners of the flap so as to prevent bulging of the tissue. In a month's time, the inverted surface was just as smooth as other parts of the gum tissue.

Herb—Bilateral antral empyema.

This is a syphilitic case terminating in paresis. Patient died a few months after operation.

Mrs. L., aged thirty-five years, had complained of pain in both sides of her face for sixteen years, and from her appearance, I felt sure that her statement was not exaggerated. The pain radiated into the superorbital and occipital regions. A diagnosis of antral involvement was made. During the high operation, the writer found that the bone was necrotic and impinged on the infraorbital nerve. A considerable area of the outer plate of the superior maxillare

Figure 16.

Mr. J.

was removed and a cystic condition found along the side of the naso-antral wall, which was removed. The osteum maxillary was enlarged by removing the membrane from that area. The infraorbital nerve seemed considerably hypertrophied, due to constant irritation. The nerve was put on the stretch and about an inch and a quarter of same resected. This was done September 30th, 1919. On October 10th, ten days after operation, she was free from pain and is making rapid progress towards complete recovery. This operation was also done under local anesthesia.

Mr. J., aged twenty-four years, occupation, auto-worker, had complained

of pain in the upper, right jaw for several months. On examination, a fistula was found a short distance above the alveolar border. His physician diagnosed his case as one of necrosis, and sent the patient to the writer for an operation. Diagnosis was made of antral empyema. The bone was slightly involved at and above the antral floor. A liberal opening was made in the floor of antrum and the lower part of antrum curetted. The wound was packed with borated gauze. Two days later, on removal of the gauze, a shiny surface was noticed. A blunt probe was used which

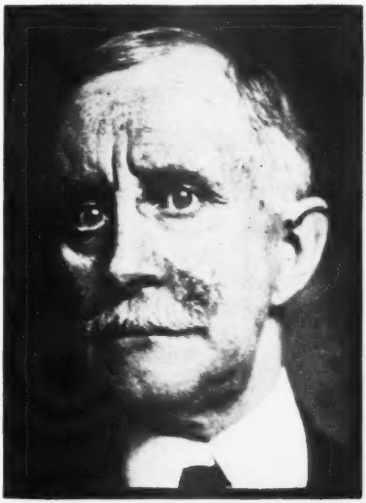
Figure 17.

Mr. J.

transmitted the feeling of enamel. A long, beaked bayonet root forcep was used to extract the supposed tooth, which it proved to be. Further sounding elicited the same sense of touch, and another molar of large size was found firmly imbedded which was removed. The tooth was high up, near the nasal wall. The other tooth was near the malar region. Further exploration made me feel that more teeth, altho small, were evidently imbedded within the antrum. In using the curette, several teeth germs were removed, some being lost in the operation. In a month's time, the wound was free of pus and the antrum healed rapidly. You will observe that all the teeth are covered with serumal calculus. The molars at either end of slide are of large size and of splendid texture.—Local anesthesia was used.

Mr. S., aged sixty-two years, occupation, expert accountant, complained of pain in the region of the upper, left, first molar. His pain could be controlled only by morphine. On his second visit, the first and second molars were extracted, when it was observed that the

Figure 18.



Mr. S.

Figure 19.

Mr. S.

antrum was involved. On account of the characteristic appearance of the antral tissue, a diagnosis of malignancy

was made occurring within the antrum. Some of the tissue was removed, and on examination, it proved to be an epithelioma.

Figure 20.

Large antral obturator, used when there is a marked devastation of tissue, without which speech is materially impaired.

Figure 21.

Mr. Sm. Radiograph of the sinuses—antero-posterior position. Showing marked density of left antrum.

The progress of the disease was so rapid that operation was contraindicated. We resorted to radium treatment, but to no avail, as the case was hopeless from the start. About four months later, he died in the County House. The patient was an alcoholic and had lost out in every way. He did not fear death and made a brave fight.

Discussion.

Truman W. Brophy, Chicago.

I esteem it a great honor to appear before this audience to discuss the paper that has been read by my friend, Dr. Oakman. I had hoped that he would read the earlier part of his paper because it contained so much of value from the anatomic and pathologic point of view. The cases were extremely interesting and they have spoken for themselves, so I will not dwell upon them. I will speak only regarding the conditions we have to meet in the management of such cases, and I will say that I approve of everything that has been said by the essayist, adding perhaps a few suggestions, regarding the pathology and the method of procedure in bringing these conditions into a state of health.

I do not think I exaggerate when I say that Dr. Oakman has a larger experience in the management of antrum infections than any other surgeon. He spoke of the antrum being infected from dental causes more frequently than from any other. I made the statement several years ago that I believed seventy-five per cent of antrum trouble was caused by diseased teeth. He said there were ninety per cent of the cases of dental origin. This brings up an interesting feature, regarding the accessory sinuses of the nose. In his work on the cranial cavities, Dr. M. H. Cryer, of Philadelphia, presented a report many years ago to the effect that the frontal sinus communicated directly with the antrum in a very large precentage of the cases exam-

ined. In an address before the Chicago Laryngological Society some years ago, I made the statement that Parsons, the great laryngologist, had come out with the report that in fifty-six per cent of all cases he had examined there was a direct communication between the frontal sinus and the antrum. That startled the members somewhat and they looked up the literature and found I was right. So when we treat an antrum, we must not think we have only that to deal with. There are other sinuses which are important factors in antrum disease. Moreover, speaking of the means of entering the antrum, my friend who just preceded me spoke of a small puncture thru the nose as a good one. I prefer to make a puncture thru the canine fossa, then introduce a small point of a syringe and make pressure. If the ostium maxillare has not been closed as a result of the inflammatory process, the infected contents of the antrum will be carried thru it into the nose and the antrum will be clear. That is generally all the treatment they will call for in an acute case. Once remove the contents and clear the antrum, clear it of irritating fluids, and it will get well, but in chronic cases other cases must be employed. In acute cases you cannot decide anything by transillumination. In chronic cases you can make out something by transillumination provided the antrum is filled with polypi. Polypi are generally present in chronic empyema of the antrum. I tell my students that when we open the antrum with chronic empyema, we will find polypi. Why? Because it is a chronic case.

As to opening, I am always in the habit of cutting it open with burs, because we can do it quickly. I want to say a word about the destruction of the naso-antral wall. I believe most sincerely that the Denker operation, or any other operation that calls for the removal of a large section of the naso-antral wall should be discouraged. (Applause.) On the occasion when I met the Laryngological Society of Chicago, I made this statement. There were men present at that meeting who thought it was a violation of ethics to mention a thing of that kind. I said, "Gentlemen, what do you do? You go thru the naso-antral wall for what? What is the function of the surgeon? Is it not to eliminate disease? Why do you remove normal tissue to get at the diseased process? True, you may remove normal tissue in going thru the canine fossa, but this tissue regenerates so quickly. You create a great opening in making the Denker operation so the nose and antrum becomes one cavity open to the dust and dirt of the street, which drifts into it, the mucus forms becomes incrusted and cannot well get out. When God made us, he made the ostium maxillare above the inferior turbinated bone. If we attempt to reason it out we will see that it is so placed that the entrance to the nose may be in some measure protected by the presence of the inferior turbinate bone and so that dust, dirt and fluids cannot get in easily, but if a large opening is made, you can see what happens." At that meeting to which I have referred twice before and shall do so again were some of the most noted rhinologists in this country. Quite a number of distinguished men were there from other cities. In answer to my question they said, "Yes we make flaps and close that." But when they make flaps they do not usually stay closed. Three months later two or three men of that group met me at a dinner, and they were agreed in saying that if God would ever forgive them for doing the Denker and similar operations for removal of large areas from the naso-antral wall, they would never do so again, because they knew these deposits occurred in the antrum which could not be gotten out and which left the patient in a condition almost as bad as before the operation. Besides a quantity of

normal tissue is taken away which should be left.

If we have a disease of the antrum, and if it is limited only to the antrum, we can make use of transillumination and of a small incandescent light which we can carry into the antrum and make an illumination of every surface of the cavity. You can no more tell what is in the antrum by a puncture of the naso-antral wall than you can tell what is in a barrel by looking thru the fossa hole. It is all dark. When we make an opening thru the canine, we must maintain the open by use of a plug in such a way that the patient can remove it two or three times a day and keep it clean. Keeping it clean is a necessary step in making the disease clear up.

There is so much I might say on this subject and so much I would like to say, but time forbids. I will close by saying that I enjoyed being here and listening to this paper. Dr. Oakman is so full of his subject and has so much to present that he has not had the time to do it. Let me say this word. The mucous membrane of the antrum is subjected to any disease that the mucous membrane is subjected to anywhere. It is subjected to carcinoma and all types of cancer. We have growths to remove, such as giant-celled sarcoma, which often originates from the sphenoidal fissure. All these things must be borne in mind when we treat the antrum, because so much disease can come from the nasal cavity, the frontal sinuses, the infundibulum, the ethmoid cells, etc.

Dr. Oakman: If you can make a correct diagnosis and operate accordingly, your treatment is simplified. If you have polyps, it is necessary to do a radical operation. It is well to bear in mind that cases of migraine are frequently due to antral involvement. Migraine is frequently a diagnostic symptom of antral disease and is a symptom which has been greatly neglected.

Doctor Bogle asked about treatment after operation. The wound is packed with plain gauze, emersed in balsam of Peru or tincture of benzoine. This is left in the antrum for two or three days. A smaller amount of gauze is used in each subsequent treatment. The gauze should be discontinued as soon as possible—usually in about a week.

I wish to state that whatever I have accomplished in Oral Surgery is due to the start I received from my friend, Dr. Truman Brophy.

CONGENITAL NON-OCCLUSION.

By Paul R. Stillman, D.D.S., New York City.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

CONGENITAL non-occlusion is a condition of the teeth which is characterized by an entire absence of occlusal contact of one or more of the opposing teeth, when the jaws are brought together in any of the positions which the mandible is capable of assuming. It is of interest to periodontists because of the fact that cases which manifest this deformity, sooner or later develop a pathologic periodontium. It is of interest to orthodontists, for it is a phase of mal-occlusion.

The term congenital non-occlusion has been here used for the reason that there was found no acceptable term in present use with which to designate this condition. The introduction of new terms or synonyms for those which are already in common usage is correctly held to be a reprehensible practice, for the reason that it encumbers nomenclature. But when a condition arises where there seems to be no scientific term in common use with which to designate a subject, as in this instance, the mother of invention knows no law.

Congenital non-occlusion is the absolute antithesis of traumatic occlusion. In the latter condition we observe an excessive impact of the teeth whenever the jaws are closed. In congenital non-occlusion there is an entire absence of occlusal contact of certain of the teeth at all times, no matter what position the mandible assumes. It is because of this characteristic relation of the teeth that this condition has been termed in the vernacular of the prosthetic laboratory an "open bite." The incongruity of this term is apparent, and should make its appeal to fancy when applied to a condition in which the teeth are incapable of biting.

This phase of mal-occlusion may occur in all of the three classes of the Angle classification. It rarely occurs in Class I., altho typical instances have been observed, but in Class II, div. 2, and in Class III, it is common. It is in these latter classifications that the greatest jaw deformities occur and the untreated deformity will usually develop periodontoclasia during middle life.

The etiology of this type of periclasia has its foundation in absence of function, for in this condition the teeth are never even partially brought into use in mastication. Every physiologist holds that normal function is a requisite for health, and it will be readily seen that periodontal atrophy and infection follow this condition as natural sequela.

Whenever the mandible is used in the function of mastication, the movement is a mechanical one. That is it operates as does every other body movement, under natures laws. These laws are really the foundation of the science of physics and govern the movement of all mechanical things. The relation of the several parts of any apparatus, when brought into function, must co-ordinate. That is they must each work in reciprocal

harmony of motion with every other part. Absence of function is as disintegrating to all mechanical things as is over use. Function is a requisite of health.

A comparison of traumatic occlusion and congenital non-occlusion with normal occlusion may serve to bring out more sharply the salient features of this condition, from the standpoint of function. For this purpose we may take as an example the thermometer. In this instrument the zero point was fixed at some arbitrary point; temperatures are recorded as being either above or below zero. In a similar manner the various occlusal relations may be stated. Normal occlusion will then be represented by the sign zero. Traumatic occlusion as occlusion plus or supra occlusion, would range above zero, while non-occlusion stated as occlusion minus would be recorded below the zero point. The conspicuous feature of this abnormality, and the one which is of greatest interest to the periodontist, is the complete absence of function, for these cases all show a decided lack of development of the alveolar process. To this may be attributed the atrophic phenomena which follow later and which characterize the pathologic changes observed in the periodontium.

Normal function provides the exercise necessary to maintain the tone of these tissues and their blood vessels. Upon tone depends health, development and resistance to infection. In the absence of function the tone of the parts are inevitably lowered. In order to bring out more clearly the bearing which tone has upon health and immunity to infection, the simile of the thermometer will again be useful. The tissues around a tooth which are in occlusion plus, are performing their functions, even tho it is in excess of the normal and the tone of such tissues, while never normal in consequence of the excessive stress, are never the less high in biogenic tone. While the irritation of the traumatic occlusion may open the way for infection to such an extent as to cause breaking down of the continuity of the tissue, never-theless when the burden of irritation is lifted, the tone of these tissues enables them to give a sharp biologic response. In other words, when proper treatment is instituted, cases of plus-occlusion invariably show a definite improvement, for the reason that such treatment lifts a definite burden of irritation from the over-worked periodontium. In cases of minus occlusion or congenital non-occlusion the tone of the periodontium is below the point of zero. Such tissue, when subjected to even mild bacterial invasion, may fail to show a response to any form of treatment. This is due to the fact that we are unable to lift or remove the burden of mechanical irritation for the reason that no such burden exists to produce trophic changes in these tissues. These cases give small response or biologic reaction to treatment, due to the absence of a tissue tone which might activate a reaction. Such a state is characteristic of the advanced cases of congenital non-occlusion in regard to treatment.

Atrophy then, which follows closely upon disuse, becomes at once the chief factor in the development of the pathology of these cases. They constitute a typical periodontoclasia and are characterized by the presence of atrophic changes in the gingiva, identical with a mild chronic gingivitis. In the advanced stage the teeth become loose, due to a loss of their supporting structures. These cases seldom exhibit a firing up of acute suppurative symptoms because there exists a diminution of tissue tone. There is little soreness or pain of any character and at times when the chain of symptoms has reached a termination, such teeth are frequently exfoliated with an almost imperceptible hemorrhage.

These cases are characterized in radiographs by the symmetrical absorbtion of the alveolar process, both at its crest and later on in the lamina dura of the process.

In congenital non-occlusion as in every other form of periodontoclasia, there are two or more etiological factors which in combination produce the lesion:

(1) Absence of function or disuse; this is the primary factor.

(2) Mechanical irritation from the deposits of calculus and other debris which in addition act as carriers of bacteria.

(3) Lowering of tissue tone and malnutrition due to lack of function.

(4) Infection, due to the introduction of bacteria. Bacterial irritants thus introduced are one of the secondary factors, the other being the loss of tissue tone just mentioned.

Treatment consists of the removal of the etiological factors in the order of their importance and influence.

(1) Removal of the deposits of whatever nature leaving the cementum in a highly polished condition.

(2) Maintaining of root surface cleanliness.

(3) Stimulation (by the patient) of the gingival tissue circulation by the proper use of the tooth brush. This stimulation is chiefly beneficial to the gingival structures. For it has been recognized that the deeper structures are but slightly influenced by this kind of treatment. The tooth brush however furnishes the best means of awakening the biologic forces of repair.

In dealing with other pathological conditions of the periodontal tissues, it is possible to hold out with decided optimism the favorable results which may be expected to follow treatment, when such treatment is based upon correct clinical findings and diagnosis. In these cases of congenital non-occlusion we have disuse atrophy of the periodontium and they hold out small hope of success in treatment even to the most skillful operator. For it must be remembered that nature and not the surgeon brings about the cure.

Discussion.

H. E. Kelsey, Baltimore, Maryland.

This paper is very interesting to the orthodontists. We thought he was going to give us the etiology of non-occlusion itself and not the etiology of the condition which it produces. I am sure he would tell us if he knew what causes non-occlusion. We do not know definitely ourselves in a large percentage of cases, but are very much interested. The term we have used for non-occlusion as Dr. Stillman calls it, and which we have thought to be scientific, is infra-occlusion, but except among orthodontists the condition is as, as he says, more commonly known as open bite.

That it should be a cause of frequent and serious disturbance of the peridental membrane I feel is a point well taken, and as he has become interested in this subject the orthodontists hope he will carry his investigations further to the etiology of the condition itself, thus perhaps throwing some further light upon the subject that interests him most. The orthodontists would certainly welcome any addition to their present meagre etiology of this form of malocclusion.

I. Hirschfield, New York.

I would like to ask Dr. Stillman if he would not, in his treatment of cases such as his paper refers to, include also the building up of the occlusal surface to a point of articulation with its opponent, wherever possible. In cases where this would be physically counter-indicated, would he not advise the patient to use such teeth, if only for the partial mastication of the larger morsels of food?

I believe such steps would be a good

means of stimulating, physiologically, circulation in the superficial as well as in the deeper peridental tissues, and I can see the advisability of such action even as a matter of prophylaxis.

J. A. C. Hoggan, Richmond, Va.

I would like to ask one question: Your reason for coming to the conclusion that the etiology of this class of case is congenital. Later you referred to the cause of non-occlusion and you attributed it to loss of function. We know that teeth have very little function, congenitally.

F. M. Casto, Cleveland, Ohio.

I was thinking of the same question that Dr. Hoggan just asked Dr. Stillman. In looking over the program I wondered how Dr. Stillman had arrived at the subject of his paper, namely "Congenial Non-occlusion." He now informs us that it was a typographical error and corrects the subject to read "Congenital Non-occlusion."

I just suggested to Dr. Stillman that of the two words, neither of which has any connection with the type of malocclusion to which he refers, I would prefer "Congenial" inasmuch as it is more euphoneous.

Congenital conditions are those which occur between fecundation and birth in utero and could not possibly have any relation to a particular type of malocclusion. The word non-occlusion seems quite appropriate and might very well be adopted. It is of interest to the orthodontist to know that in these cases of non-occlusion there is a tendency on the part of the peridental tissues to be diseased and weakened and to present a condition of lowered vitality. For in doing an orthodontic operation in such cases, more consideration has to be given the peridental tissues than in most any other type. It is also universally agreed that this particular type of malocclusion is among the most difficult with which we have to deal. The essayist spoke about the importance of function. I believe that function and environment are the two most important things for us to keep in mind. The perversion of which probably has more to do with abnormalities and disease than anything else.

Dr. Stillman (Closing): I realize that there may be some question as to the proper use of the word "congenital" when it applied to non-occlusion. Also that there are conditions of non-occlusion which are obviously "acquired." After giving this subject some study, I am of the opinion that that type of non-occlusion which is discussed in this paper is actually a congenital condition.

THE ETIOLOGY OF PERIODONTOCLASIA
(PYORRHEA ALVEOLARIS)

By Arthur H. Merritt, D. D. S., New York.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

THE etiology of periodontoclasia has been obscured by a number of things, among them being the complexity of the factors that act as causative agents, the variety of forms or stages in which the disease manifests itself, and in confounding it with other lesions which may in some respects simulate it, but which are not typical of periodontoclasia. It is further obscured by the fact that no two cases seem to be identical in their etiology or pathology. In one, the teeth are irregular and the mouth unclean with slight and more or less uniform shrinkage of the gums. In another, the teeth may be straight, the mouth clean and the pockets deep, with little or no gum recession; all of which has served to make "confusion worse confounded." When, however one studies more closely these complex etiological factors, it will be found that they fall more or less naturally into two classes, which for convenience sake may be called primary and secondary. Again, a careful study of those causes arbitrarily placed in the primary class, will reveal the fact that irritation of some form, usually of a mechanical nature, is one of the most potent factors in the etiology of periodontoclasia. This irritation may express itself in two ways—irritation beginning at, and at first confined to the gingiva, and secondly, irritation of such a nature as to affect the entire periodontal tissues, that is, the cementum, the pericementum and the alveolar process.

Gingival Irritation.

The first of these, gingival irritation, is the more common, and as a rule, the first to manifest itself. Anything which will chronically irritate the gingiva, no matter what it may be, must be regarded as a potential cause of periodontoclasia. This does not mean that every case of gingival irritation will eventuate in periodontoclasia, but it does mean that irritation of this tissue is potentially dangerous, and that the only insurance against possibly disasterous results, is its maintenance in health. The gingiva spring from the crest of the alveolar process, and completely surround the cervical enamel. Between the free gingiva and the tooth, is the subgingival space, the floor of which is bounded by the gingival group of pericemental fibres and is the point at which the first lesion occurs as a result of gingival irritation. The gingiva perform two very important functions, both of which are essential to the preservation in health of the teeth and their investing tissues. The first of these is the protection against injury of the attachment at the cementoenamel junction. It is primarily a protective organ. In health and when of normal form, the free gingiva project themselves several millimeters above the alveolar crest, closely hugging the cervical enamel in such a way as to completely fill every interstice between the teeth, and terminating in a thin dense

edge of such a shape as to shed off, and prevent food lodgement. In childhood and in youth, when resistance is high, the gingiva will withstand an immense amount of abuse, but long continued neglect will eventually break down this protective barrier, thereby opening the door to some of the most serious diseases occurring in the mouth. The second function of the gingiva, and one closely related to the first in its protective character, is the maintenance of the teeth in their normal position in the dental arch. Their rigidity in their alveoli and their normal relation to each other and to the teeth in the opposing jaw, is due more to the healthy gingiva than to the alveolar process. The importance of this should not be overlooked in the study of occlusal trauma, inasmuch as it raises the question whether or not, the latter may not be dependent for the exercise of its destructive influence, upon a previous disturbance of the gingiva. It is probable that there is a closer relationship between diseases of the gingiva and traumatic occlusion, than is generally realized. It is quite possible that the former antedates and may invite the latter.

Among those irritants which begin at, and are at first confined to the gingiva, the most common, and the chief of offenders, is uncleanliness of the mouth. The habitual accumulation of food debris in, between and about the teeth, and especially in the subgingival space, together with the deposits associated with such neglect, is the chief source of gingival irritation, and in turn responsible for more cases of periodontoclasia than all other causes combined. The importance of mouth cleanliness in its relation to this disease cannot be overestimated. It is probable that if the mouth was kept normally clean, and the gingiva preserved in health, diseases of the dental investment would be almost unknown. This statement is made advisably with a full realization that there are other factors to be considered, and that it is possible to tolerate filth in the mouth thruout life without the development of periodontoclasia. If the gingiva can be maintained in health, despite the neglect of mouth hygiene, under certain conditions, periodontoclasia will not develop; the real problem is the maintenance of the gingiva in health under conditions so adverse.

Another of the sources of gingival irritation is faulty restorative operations, as represented by banded and shell crowns, partial dentures, overhanging edges of fillings, defective aproximal contact points, etc. All are familiar with this class of gingival irritation, which needs only to be mentioned, to be recognized. Ignorance or carelessness is its explanation. Education of those responsible for such conditions, is the only remedy. This must be done with the undergraduate and be emphasized as it has not been in the past.

A third source of gingival irritation is trauma, by which is meant some injurious agent introduced from without, and producing an injury such as would result from the incorrect use of the tooth brush, ligatures, clamps, etc., and from the impaction of food between teeth with defective contact points.

This briefly summarizes the chief causes of gingival irritation, which latter is regarded as being, in many instances at least, a precursor of periodontoclasia. Black says on this point (1) "Some form of gingivitis always precedes the formation of a pus pocket." On the other hand Hopewell-Smith says, (2) "Pyorrhea Alveolaris does not begin as a gingivitis—It seems impossible to imagine that if the gingivitis was, alone or combined with tartar, responsible for the pathological conditions, there could be no alternation in the bone *at the apices of the roots,* or in *situations far*

removed from the surface of the gum. But this occurs."

In this Hopewell-Smith is probably in error. The changes which he observes to have taken place "at the apices of the roots, or in situations far removed from the surface of the gum," may not, and probably were not, directly caused by gingivitis, but were the changes which are known to take place as a result of* that form of irritation conveyed to the entire periodontal tissues, known as traumatic occlusion, and which may exist and cause the changes referred to above wholly independent of gingivitis.

Traumatic Occlusion.

Chief among those mechanical irritants which are of such a nature as to cause injury to the entire pericementum, and if long enough continued, to the alveolar process also, is traumatic occlusion. As one of the causes of periodontoclasia, this is a form of irritation, difficult to define. It would seem to be due primarily to a lack of harmonious coordination of the inclined planes of the teeth when brought into occlusion, in the process of mastication. The result is, that the force which should be dissipated thru a slight play of tooth on tooth, is communicated to the supporting tissues of the teeth in such a way as to force them outside their normal lim'ts of motion. The motion is at first very slight, but rapidly increases with the increasing mobility of the teeth and is followed by more or less marked changes in the pericementum and alveolar process. The first of these to occur is thickening of the pericementum with a coincident absorption of the edge of the alveolar process at the gingival margin. Regarding these changes on the pericementum Hopewell-Smith says, "Normally measuring in middle age from 0.2 to 0.3 m m., it may extend to the enormous width of 1.0 mm." Equally marked changes occur at the apical region he asserts. The alveolar bone, he says, "exhibits even before the gum the most important metamorphoses which have occurred. Briefly they are those produced by the process of halisteresis (lack of lime salts.) Not only is the free margin of the bony socket absorbed by osteoclasts near the upper and lower parts of the cervical regions of the teeth, but deep down at the radicular portion, giving the surface an eroded appearance; moreover, there is also a decalcification of the most superficial portions." As indicated above Hopewell-Smith does not ascribe these changes to traumatic occlusion, but to osseous atrophy. In this I believe he is mistaken.

There are several factors which contribute to this occlusal maladjustment, such as abnormal tooth forms, habits of occlusion, malocclusion, restorative defects, etc. The outstanding fact is that the occlusal surfaces of the teeth show very little wear, the cusps are generally long, limiting thereby the triturating motion of tooth against tooth. If a study be made of ancient skulls, quite a different condition will be found to prevail; the occlusal surfaces of the teeth will show marked wear as a result of mastication, often to the extent of complete obliteration of cusps. It will also be noted that the bony investment of the teeth is intact and usually of considerable thickness, showing that the mastication to which these teeth were subjected, while great enough to completely obliterate the cusps, in no way impaired the health of their investment. The very fact that the cusps are so worn, may be its own explanation. The course food used required great force in mastication, but the teeth were saved from the wedging effects of such force by the wear of their occlusal surfaces, permitting greater freedom of motion of tooth against tooth.

Another factor to be considered in the

*(2) (Normal Pathology and Histology of the Mouth, Pages 287 and 289, and (1) Special Dental Pathology, Page 161).

study of traumatic occlusion is the thickness of the alveolar process. As is known to every dentist, this varies greatly with individuals and races. Teeth supported by a thin osseous investment will not withstand the strain that teeth will more firmly supported; when subjected to adverse conditions they are more easily disturbed. The use of soft food requiring little mastication has resulted in small and undeveloped jaws, with teeth, the roots of which are subnormal in size and supported by an alveolar process much thinner than that of primitive man.

These briefly are some of the conditions which make for and explain that form of irritation affecting the entire periodontal tissues known as traumatic occlusion and which unless recognized and corrected will make a cure impossible in any case.

Secondary Etiological Factors.

A consideration of the secondary etiological factors of periodontoclasia, involves a consideration of the possible relationship of systemic disorders to this disease. This is a point around which wordy battles have been waged, and conflicting and often irreconcilable theories have been advanced. There are those who believe that periodontoclasia in its various manifestations, is but an expression of some more or less serious systemic disorder, some going so far as to assert that certain diseases, such as diabetes, tuberculosis, syphilis, etc., express themselves in the mouth in characteristic types of periodontoclasia.

An example of the wide diversity of opinion on this point held by leaders of the profession, the following is cited: Hopewell-Smith in his recent book on "Normal and Pathological Histology of the Mouth" says regarding what he terms "pyorrhea; etiology, undetermined at present, but probably constitutional diseases coupled with infection of the gum margins with pyogenic cocci, may briefly be considered potent factors in its causation. Pyorrhea Alveolaris does not initiate, but is produced by the same septic causes which lead to general systemic affections."

Black in his book on "Special Dental Pathology" says: "It must be recognized that the general physical condition of an individual will have its effects on the progress of such a lesion in the mouth, yet I cannot today, from a review of the literature, or from my own investigations, believe that more than a very limited number of cases originate from systemic causes. I have gradually come more and more to the belief that careful observation and records during the early stages will establish the fact that there is a local exciting cause in nearly every case."

Periodontists everywhere are more and more inclining to the latter belief. While recognizing the possible effects of constitutional disorders upon the etiology and progress of periodontoclasia, they have regarded such conditions in the light of possible predisposing rather than exciting causes. For convenience sake, they have classified these secondary factors as Abnormal Systemic conditions, recognizing under that classification the possible influence upon periodontal diseases of such factors as blood supply, nutrition, faulty elimination, etc; Chemical Irritations, such as might be expected to result from bacterial toxins, organic and inorganic acids, decomposition of food debris, etc.; and lastly, Predisposing Local Conditions, such as might obtain thru structural defects in the subgingival space, (which by the way are very common) mouth breathing, frail bony support of the teeth, etc.

As indicated above, these conditions are looked upon by the periodontist, whose large clinical experience in the treatment of these cases especially qualifies him for judgement, simply as pre-

disposing factors which are to be taken into consideration, but which are not probably large factors, and in the absence of local exciting causes, usually non-operative. It is not unlikely that given such predisposing factors, the disease once established by localized exciting causes, may make more rapid progress, or may not as readily yield to treatment.

Briefly summarizing the etiological factors of periodontoclasia, it may be said that they are arbitrarily, divisible into two groups—primary or exciting and secondary or predisposing; that the one characteristic common to all the primary factors is that they are irritative in their nature, and depend in large measure upon this quality for the initiation of periodontal diseases; that this irritative feature may express itself at the gingival margin only, where it brings about a solution of continuity in the floor of the subgingival space, or thruout the entire supporting tissues of the teeth, each manifesting itself in a pathology wholly characteristic, yet entirely unlike the other; that the secondary or predisposing factors, as their classification indicates, are dependent for the exercise of their influence, upon local exciting causes; that the one outstanding fact in the prevention of periodontal lesions, is the maintenance of the gingiva in health; and that the chief instrument to that end is mouth hygiene, than which nothing is of more importance in the whole realm of dental practice.

Discussion.

J. J. Sarrazin, New Orleans, Louisiana.

I have not heard the whole of the paper. Fortunately, being somewhat familiar with Dr. McCall's most excellent chart, I can say that its fundamental ideas are unquestionably right. There is no question that primary and secondary causes have been clearly defined. There is also no question that there may be secondary causes outside of the infective factor, which latter necessarily is the primary one.

On the other hand, such secondary factors as are mentioned in Dr. McCall's chart are of the utmost importance. I see nothing to criticise in the plan as a whole, but in some of the minor details we might think of some side considerations which will bear giving a little attention to. For instance, we talk of irritation, constantly losing sight of the fact it is not the mechanical irritation which counts since there is not motion enough to generate it. The important factor is less the mechanical irritation than the harboring of pyogenic germs. A minute gap of a ferrule or the gingival irritation of a filling is larger to germs than the mammoth cave is to us. A place is created where germs lodge, and no matter what efforts are exerted, even with the approximal taping and by the Prophylaxist, they remain in contact with the gums; hence the absolute necessity of leveling all such conditions, so as to afford no opportunity for the lodgement of germs. I mean that it is not mechanical irritation, but really toxic irritation from the germs thus lodged which do the damage and start the process of infection.

Another important point, I think, is that systemic conditions should be taken into account when it comes to the restoration and rebuilding of tissue in a wound where, after curettement, we have cementum on one side and mucous and diploetic tissue on the other. We there have a condition which demands on the part of nature a greater effort to repair than that where the surgeon has two muscular flaps or two mucous flaps which he can put in apposition, and where nature immediately throws out loops to join them together.

After our surgical interference we have nothing to unite with something else. Repair must be done by granulation under favorable circumstances.

Therefore, under such conditions, any systemic vice which hinders the easy and complete reproduction of cells by means of capillary loops being first thrown out,—any systemic condition which tends to lower resistance by slightly reducing the proportion of hemoglobin and phagocytes in the blood, is an unfavorable factor, and when we consider that the spleen destroys all blood cells which become slightly infected, then we must recognize the fact that any systemic condition which may impair the perfect quality of the blood, or which fails to give to the blood elements it requires because of some neurotic vice, or which hampers its perfect distribution to tissues above the heart, becomes an important and dangerous factor.

While neurasthenia, the slightest shade of anemia and of kidney lesion are causes for worry, I am not at all ready to say that tuberculous patients in early stages tend to be unfavorable, because anemia appears later only. Sometimes anemia may be local only, a question of distribution and not of quality of blood. The tendency of the blood is to be distributed to the upper tissues less plentifully than elsewhere in the body; and that interests us particularly because the jaws depend upon the heart pumping blood against gravity to the upper tissues, and they depend upon arterial blood for repair. If we stood on our heads, the proposition would be reversed; but we don't have to, if we apply suitable hygiene and exercise.

C. S. Kramer, Woodman, Colo.

My work is wholly for the tuberculous. I work only with tuberculous patients. Tuberculous patients, contrary to Dr. Sarrazin, are somewhat anemic. Their gums are pale. Their red count is usually down a little. The tuberculous patient does not have pyorrhea more than the ordinary healthy individual in the same walk of life. There is one thing that might be confused with pyorrhea in the tuberculous patient, and that is the tuberculous ulcer that does sometimes occur in the mouth. If it should happen to occur along the gingiva—and it might as well occur there as further up on the gum tissue, or in the palate or in the throat—it might be mistaken for pyorrhea. However, in those cases, the dentist is rarely called, because the tuberculous patient with the tuberculous ulcer in the mouth, usually has a far advanced pulmonary, accompanied by laryngeal tuberculosis. So I do not believe that pyorrhea and tuberculosis are associated one with the other.

However, we do feel that the mouth infections should always be cleared up in order to give the patient as much benefit as possible in combating the tuberculosis.

M. D. K. Bremner, Chicago, Ill.

I read a little story somewhere that one of the early Christian elders was asked by a fellow with the intention of annoying him: "Can you teach me the tenets of Christianity while standing on one leg?" The elder was entirely nonplused and he said: "Do unto others as you want others to do unto you," or something to that effect. "Is that all there is to your religion?" demanded the man. The elder replied, "Yes, the rest is merely details."

In listening to Dr. Merritt's paper, it occurred to me to stop and think,—What is the main point? What is the one thing we can glean from his paper? I have in my mind jotted down this one point; it is to keep the mouth in a natural condition. Dr. Merritt has spoken of the condition we see in the mouths of civilized people not found in the mouths of people living in barbarian times. He has also mentioned the fact that in a great many cases some of the gingiva can be maintained in health, even tho there is not much cleaning done to the teeth. Evidently, this is a natural con-

dition. The gingiva just keep in shape without any particular care.

There must be a natural reason and that reason, I think, is diet—the foods we eat.

It seems to me, as periodontists, we ought to pay more attention to the question of diet than we do. We ought to educate ourselves on the problem and in turn try also to educate our patients. I just lately ran across a story that has a great bearing on periodontia and on the question of diet. Some of you may have heard of what is known as McKalem's cow test. He had taken three groups of heifer calves all of the same breed. He fed one group just wheat, nothing else but wheat; another group nothing else but oats, and another group nothing else but corn. When the calves matured those fed on wheat gave birth to dead offsprings weighing about forty or fifty pounds, which was approximately twenty or twenty-five pounds less than the normal weight of calves of that breed. Those fed on oats gave birth to calves of normal weight, about seventy or seventy-five pounds, but still-born. Those fed on corn gave birth to normal healthy calves and those grew up and became normal, healthy cows.

As the man who relates the story says, it shows there is something more in food than so many calories in heat units. Coal has heat units but is not a food.

The proposition for the periodontists is to get thoroly acquainted with the whole problem of diet, as far as possible. That is the foundation of the whole subject and that is the direction toward which our efforts must be directed.

Arthur H. Merritt, New York: In answer to the question of one of the members, I would say that as the paper dealt with etiology and not with treatment, the correction of traumatic occlusion was purposely omitted from the paper. For his information I am glad to say that I usually correct it by grinding, using small carborundum stones. I was interested in what Dr. Kramer said about tubercular patients as he is better qualified by experience than any other man in the country engaged in periodontia to speak on this subject. I am glad to learn that his observations confirm those of us who have been less fortunate in our opportunities for observing this class of patients.

The question of diet to which Dr. Bremner calls attention, is undoubtedly an important one, but unfortunately no one knows anything about it of an exact nature. Until we do, it seems to me unwise to experiment with the diet of our patients..

CAST CLASP TECHNIC IN REMOVABLE BRIDGE-WORK.

By Norman B. Nesbett, D. M. D., Boston, Mass.

(Read before the National Dental Association at Its Twenty-third Annual Session, New Orleans, La., October 20-24, 1919.)

TECHNIC may be defined as the method by which an artist uses his materials to express his mental conceptions. Hence the higher those mental conceptions, the more carefully planned will be the technic elaborated to fulfill those conceptions. A technic planned with the sole idea of producing something, must always fall before the technic of the one whose vision leads him to build a technic that turns vision into actual result.

Many examples to illustrate the foregoing might be given, but one will suffice. It has become an axiom that the perfection of product of the gold inlay worker is in direct ratio to the care he uses in following out the technic employed.

The cast clasp, used as an anchorage for removable bridge-work, has proved its worth, and used where indicated, *where mutilation of the abutment teeth is not desirable,* cannot be excelled by any known attachment now before the dental profession.

The experimental work done to produce the technic first presented to my profession early in 1915, extended over a two-year period of 1913 and 1914. During that two-year period of experimental work, many ideas and methods were tried and finally discarded. This, with the vision ever in mind of ultimately placing before the dental profession a completed technic, scientific and yet at the same time practical and simple as possible. Of the discarded methods of producing a cast clasp, I will mention the following:

Experiment No. 1. Adapting casting wax and other wax directly to the abutment teeth in the mouth and attempting to remove the pattern.

Experiment No. 2. Adapting base plate and other kinds of wax to the teeth on a plaster model and casting—1st, by cutting the teeth off the model, investing the whole mass, and casting—2nd by removing the wax pattern.

Experiment No. 3. Painting liquid casting wax on a model of the abutment tooth poured with inlay investment, investing the tooth and pattern and casting. This same method was also tried with variations such as: 1st. Adapting thin casting wax to the tooth and building up the pattern to the desired thickness with other casting wax. 2nd. Adapting a thin pure gold matrix and then building up with casting wax. 3rd. Using a harder refactory material than inlay investment and casting direct to the tooth. Experiment No. 3, with its variations, is the popular method followed by those who believe that the present technic is too difficult. If ease of execution had been the only desideratum, our experiments would have ended with experiment No. 3.

Quite satisfactory cast clasps can be

produced by the use of all the foregoing methods.

Experiments were then conducted on models prepared with removable teeth, Weinstein's Artificial Stone being first used. This, altho far harder than plaster of Paris, and indispensable in practically all prosthetic operations, proved too soft and amalgam was then substituted. These amalgam teeth proved satisfactory and are used at present. Experiments were also tried with the use of horizontal notches cut into the enamel of the buccal and lingual surfaces of the clasped teeth; and with the use of short round headed pins or spuds set into the buccal surfaces of the abutment teeth. These pins engaged corresponding depressions in the buccal arms of the clasps, much in the manner of a glove fastener. As the idea of these devices is to gain additional retention to compensate for a poorly fitting clasp, and as the cast clasp should be used with the idea of *avoiding* tooth mutilation, the writer considers their use contraindicated. Indeed, he considers their use in an average case a confession of inability to make a proper fitting cast clasp.

Early experiments showed that it was very difficult in all cases, and almost impossible in some cases to test the proper fit of a cast clasp by trying it on the abutment tooth in the patient's mouth. Therefore some other means of obtaining the correct relations of the clasp to the teeth, other than the customary methods of first taking an impression with the clasps fitted to the patient's teeth, had to be devised.

Our technic was developed with the idea of having an unblemished model on which to build the case, take relations of clasps in their *correct* positions, and make final fittings and adjustments; but best of all, it enables us to properly design our clasps, and know that we can get the bridge easily in and out of position when completed. The technician who destroys his model at any phase of the process is obliged to wait for a trail in the patient's mouth with the result that much tedious blind grinding often has to be done before the piece can be adjusted.

"The practice of every art," says Professor Huxley, "implies a certain knowledge of natural causes and effects; and the improvement of the art depends upon our learning more and more of the properties and powers of natural objects, and discovering how to turn the properties and powers of things and the connections of cause and effect among them to our own advantage." The most practical thing in the world is the most scientific. In fact, nothing becomes really practical until it is put on a scientific basis; that is, until its relation to other facts is known and noted. To be scientific as well as practical a cast clasp should not be a mere inert, bulky ring of metal, but should be resilient to a slight degree; not much heavier than a wrought clasp of 24 gauge (B. & S. Standard), but most important of all, should grasp the tooth tighter at its ends than at anywhere else. This last named property is obtained by forming under tension of casting wax pattern on a metal tooth. Owing to the shrinkage of casting wax used (Taggart's) this tension is released when the pattern is chilled and removed from the metal tooth model, causing the two ends of the pattern to draw together slightly. This, with a further contraction of the casting metal, cast in a cool mould, causes the finished clasp to grasp tighter at its ends than at any other point in its circumference. This grip is highly desirable because of the following facts:

Masticating force applied to a clasp type removable bridge tends to move it principally in three directions—gingivally, mesially and distally. Three inclined planes are brought into play in

each clasp; one at the occlusal rest, and two at the ends of the clasp arms. The tendency of the bridge to act as a wedge is slightly increased by the inclined planes of the occlusial rests, and these forces must be correctly counter-balanced by a strong resistant grip at the *ends* of the clasp arms or the bridge will fail in time, due to the opening and loosening of the clasps or the shifting mesially and distally of the abutment teeth. Comparatively slight gripping power is required to retain the bridge against all ordinary efforts of mastication, but great strength is required in the clasp arms to keep the abutment teeth from migrating and consequent loosening, and to limit the lateral motion of the piece. Theoretically, the use of the round wire clasp gives the greatest insurance against future disintegration of the abutment teeth, but unfortunately the round wire clasp has not the forenamed properties of the cast clasp. If the round wire clasp had succeeded in cases where the cast clasp has succeeded, the cast clasp would have no excuse for existence. The writer is frankly willing to admit that he has, for twenty years, always used the round wire clasp wherever he could, but that he cannot now substitute it for the cast clasp where the cast clasp is indicated. He also has had occasion to note, since the cast clasp became popular, its use in many cases of prosthesis where the use of wrought clasps of either wire or sheet clasp metal would have been much better.

The successful prosthodontist must invariably be the one with many methods at his command. No one type of appliance or attachment will fit every case. Depending upon his wise selection and proper application of the many forms of attachments now in use, as well as upon his technical ability, will his work succeed or fail? To those of my profession who, seeing the value and popularity of the cast clasp have hastened to put out a technic of their own, I have this to say. It is promptness of execution that puts the value into any idea. The best idea in the world is valueless until put into working shape and used. The technic of the cast clasp was put into working shape in 1914, and has been in use ever since. Your essayist believes with the late Theodore Roosevelt, that every man owes some of his time to the upbuilding of the profession or business to which he belongs. The host of friends of the cast clasp bridge already in the dental profession is proof positive that the writer's experimental time was not spent in vain.

THE VALUE OF THE CLINICAL LABORATORY IN THE PRACTICE OF DENTISTRY.

By Guthrie McConnell, M. D., Cleveland, Ohio.

(From The Research Institute of the National Dental Association, Cleveland, Ohio.)

IN THE practice of medicine or dentistry our patients come to us on account of feeling or believing that something is not right with their physical condition. Such sensations or symptoms, as we call them, may be placed into two large groups, objective and subjective, and it becomes our duty to make a diagnosis from such symptoms. That group which is the more difficult to evaluate, is the subjective, as in it belong all those symptoms which can be perceived by the patient alone. No one can prove or disprove that another person has or has not a headache. Pain also is largely subjective, and when one deals with that type known as the neurasthenic, it becomes practically impossible to separate fiction from fact.

On the other hand the objective symptoms are those whose presence can be proved by some of our methods of diagnosis. A patient claims to have a broken arm, if there is any doubt about it, a roentgenogram will soon settle the discussion.

In general practice, however, it is not always possible to have every variety of diagnostic apparatus in one's office, nor even having it, would every one be able to use it. No man can be a specialist in every line. Consequently there should be some way by means of which both the practitioner and the patient shall obtain all the information that is possible. That this is extremely important is being realized more and more widely, because, without a thoro knowledge of the underlying causes, the proper treatment cannot be carried thru.

As yet the inter-dependence between local and general conditions is not thoroly realized. It must be borne in mind that many a generalized disturbance of the body may rest upon some obscure localized lesion. For many years the close association between a septic inflammation of the heart and a tonsillitis was not recognized. Nor was an acute inflammation of a joint thought to depend in any way upon an abnormal tooth. That such a correlation does exist is now being realized, in fact the present danger is that the importance of the focal infection is being over emphasized.

From the view-point of the practitioner, the important thing for him to determine is the source and the nature of the conditions that have given rise to the symptoms noted. This may prove to be very easy, or very difficult. A great danger lies in the fact that too many men feel that they can make a diagnosis without bothering to check up their results. It is a very easy matter to say "malaria" when some one develops a chill and high fever, but unless the specific organism of the disease can be demonstrated in the blood, such a diagnosis is unwarranted. Many a man and woman are crippled for life because some one diagnosed the condition as rheu-

matism and quit. In either of the two examples cited, the cause might have been a streptococcus. In this day and generation, the majority of the public are sufficiently widely read to demand that they get the best of treatment.

Not only does the treatment depend upon knowing what the cause is, but the prognosis of the case rests upon an accurate diagnosis. It will make a great difference whether that lesion on the tongue be syphilis or cancer. If the first, the patient can be cured and will live for many years as far as anv syphilitic trouble is concerned, but if it be cancer, the outlook is very poor. We can, therefore, say without fear of contradiction that unless we know what the conditions are that exist we cannot treat the patient properly, nor can we be sure what the outcome will be.

As stated before, not everv man can have a fully equipped clinical laboratory, nor if he had it could he use it. There are, however, certain very simple pieces of apparatus that every man can have and can use. With a microscope, a few stains and some glass slides much information can be obtained and extreme skill is not required. If a case comes into the office with an ulcerative condition of the gums, why should the practitioner make a guess as to what is present when within a few minutes he can know. The treatment and the prognosis of Vincent's angina or trench mouth will be quite different from a local infection due to a pyogenic organism. To determine which it is, it is but necessary to make a smear on a glass slide, stain and examine under the microscope. In the angina there will be found numerous fusiform (spindle-shaped) bacilli, with the accompanying spirilla. When once studied there will be no doubt in the future as to their characteristics. Is the infection due to a staphylococcus or a streptococcus—the answer is soon determined by the same means. One does not have to be an expert bacteriologist to make such a diagnosis, yet from the point of view such a differentiation is of importance in regard to prognosis. An infection by staphylococci is inclined to remain localized and form pus, while streptococci are much more likely to set up secondary inflammation in distant parts of the body.

The examination so far made can be done by the practitioner himself, but there are others that either require too much time or more skill than can be expected from anyone who has not devoted many hours in the laboratory. It, however, is not difficult to start such examinations and let some one else complete them. If one does not feel able to have an assistant who can devote himself to clinical diagnosis there are always laboratories to be found where such work can be done. To determine whether or not the organisms present in an infected pulp are staphylococci or streptococci is of distinct importance, but it is almost equally important to know whether the latter organism is of the hemolytic or the viridans type. It does not require much skill or much time to place some of the infected material in a test tube containing sterile culture media and then give it to some laboratory worker to carry on the examination.

As stated earlier in this article, there is an interdependence between local and general conditions that must not be forgotten if the best results are to be obtained. Without a knowledge of the general health, the local lesion may prove very refractory. A patient may have very extensive trouble in the mouth, the dentist uses every means to cure the conditions, yet they may not clear up in spite of all that is done. Both dentist and patient become discouraged and the latter drifts around from one to another without improvement. It may well be that the mouth condition was more or less

the result of a systemic disease, one that a very simple examination would have revealed. That patient may have been suffering from some form of kidney disease or from diabetes. A urinary examination would have disclosed the condition, the practitioner would have been able to make a guarded prognosis, but what is more important, he could have referred the patient to some medical colleague. The two working together would be able to accomplish much in the way of relieving both the general and local disease. The kidney lesion could not recover as long as the system was being poisoned constantly by diseased teeth. On the other hand treatment of the teeth could not be entirely successful without something being done for the nephritis. The same holds good with diabetes, in which disease glucose appears in the urine. It is a well recognized fact that the diabetic is very susceptible to infection by pyogenic organisms, such as the staphylococci and the streptococci. Again it will be found necessary for physician and dentist to pull together, by so doing the patient's general health will be improved and as a result, the mouth lesions will also change for the better.

A few test tubes, two or three solutions and an alcohol lamp or bunsen burner are all that are required, plus five to ten minutes' time. The result will well repay for the time and trouble expended, as the vast majority of people are more than willing to pay for good service.

Another form of examination, equally if not even more important, is that of the blood. This, however, is such a large subject that a paper devoted to that subject alone would be required to do justice to the subject. Such an article has been written and will soon appear. As the blood is the one substance that goes everywhere in the body, it is very likely to show evidences of trouble when anything goes wrong anywhere. If there is a focus of pus, its presence will be indicated, as a rule, by a leucocytosis, an increase in the polymorphonuclear leucocytes. Then too, the leucocytes in the normal individual are present in certain definite proportions. A differential count of the cells present in a smear of blood will show whether the percentages present are normal or abnormal. It is also of importance to determine whether the red cells are present in proper number, also whether the hemoglobin is in correct amount. This latter substance is the coloring matter of the red cells and has for its function the carrying of oxygen thruout all the body. In the various forms of anemia the number of red cells and the amount of hemoglobin will show more or less reduction.

Such examinations are not difficult, but they do require a certain amount of experience and technical skill. If the dental practitioner does not feel quite equal to the work, he should be on friendly relations with some physician to whom he can refer the case.

There is, however, one blood examination, the Wassermann, that is so important and so difficult that it should not be done except by a trained individual. This is for the determination of the presence or absence of syphilis. Many an obscure case has been cleared up by a Wassermann, yet it must be remembered that a single negative reaction is of comparatively little importance. There are so many factors to be considered that one must not lay too much stress on a negative result. In fact, the Wassermann should be considered merely as one of the facts in the evidence. If everything else points to a diagnosis of syphilis, such a diagnosis must not be discarded because one of the symptoms is absent. If a positive reaction is obtained, the great probabilities are that syphilis is present, even if other indications be lacking. Comparatively few people will

admit having had an infection, even when the evidence is undeniable.

There is still another field in which the clinical laboratory can play a part, but in dentistry this line is very distinctly limited. It is not often that the general practitioner finds tumors in the mouth, yet new growths are occasionally encountered. As a rule, these fall into the groups of cancer, syphilis or tuberculosis, and a differential diagnosis is of the utmost importance, both in regard to treatment and to prognosis. In order that a final opinion may be reached, it will be necessary to obtain a piece of the tumor and examine it under the microscope. If it be a cancer, the outlook is exceedingly grave, the patient is almost sure to die; if syphilis is the trouble, there will be little difficulty, as a rule, in healing the lesion; if tuberculosis, the chances of a complete cure are slight, but the process may remain localized indefinitely. The examination of tissues requires much experience and should not be attempted by the ordinary practitioner.

This brief outline has attempted to show the importance of the clinical laboratory in the practice of dentistry. This profession cannot maintain its position if it does not keep advancing constantly, and one of the great opportunities is in making better diagnoses. In order to obtain the best for the patient it is evident that there must be a correct understanding of his condition. This can be acquired only thru better and more complete appreciation of all the factors bearing upon the case. The most satisfactory method would be to have some one in association who could do the work, whenever it might be required. If that cannot be done there is always some laboratory expert who makes such examinations and your specimens can be sent to him. Once more should the importance of a close relationship with some practitioner of medicine be emphasized. In the past, there has been an unfortunate tendency on the part of both professions to hold aloof, a very mistaken attitude for either to take as there are so many conditions in which the combined knowledge and experience of both would be of the greatest assistance. Inasmuch as the medical profession deals with the more general manifestations of disease, it is the one that has brought the clinical laboratory to its advanced position. Now that it is here, there is no question as to the advisability of the dental profession making constant use of its facilities. Having once taken advantage of the laboratory means of diagnosis, no one will be content to guess, when he can know.

THE QUESTION OF DENTAL INFECTION IN THE PRODUCTION OF NERVOUS AND MENTAL DISEASES.

By Charles K. Mills, M. D., Philadelphia, Pa.

(Read before the Philadelphia County Medical Society, January 14, 1920.)

FORTUNATELY, the mind of the profession seems to be tending toward a very healthy discussion of the probable fallacies of dental infection in its relation to various important diseases, and of many other correlated and zealously exploited views. Shortly after the death of Colonel Roosevelt, a newspaper article appeared which illustrated one of the most dangerous forms of medical propaganda. It was stated that one of Colonel Roosevelt's teeth was the indirect cause of his death, and that thousands of persons die or are incapaciated yearly from maladies arising from infected teeth. The cases of a rescued backward boy whose brain was clouded to the point at which he could not master the rudiments of knowledge, and a youth assailed with a lethargy at the age of 15, who afterward became one of the most brilliant lawyers of the Middle West, were included in a series of cases supposedly illustrative of the marvelous results of the removal of infected teeth. *I have but little doubt that literally bushels of teeth of excellent quality have been sacrificed as the result of this atrocious article about Colonel Roosevelt.* Viewing roentgenograms, I have been skeptical as to what are designated as abscesses at the roots of teeth. It has always seemed to me that these pictures represented absorptive lacunae or artefacts of some other description, rather than true abscesses. The roentgen ray enables us to discriminate between areas of differing density. In a strict sense an abscess cannot be demonstrated by a roentgenologic investigation. *A score or more of cases have come to my knowledge in which important mental and nervous diseases have been attributed to dental infection, and in which the teeth had been removed with results in some instances so harmful as to make me feel that the procedure was almost a criminal one.* Dr. Cotton, one of the leading psychiatrists of the country, attributes many and diverse forms of insanity to dental infection. The late Dr. August Hoch, in a critical review of one of Dr. Cotton's articles, clearly points out the logical defects in the presentation. Under the influence of the propaganda of focal infection, to use the expression of Dr. Peterson, the colons of epileptics bid fair to be reduced to semicolons by operation. The appendix will soon no longer be a vestigial illustration, and the tonsil, protrusive and submerged, is sharing the fate of the ovary in our early experience. A nose and throat specialist not long ago gravely informed me that he thought of preparing a statute to be presented to the state legislature making compulsory the extirpation of the tonsils of children after reaching a certain age

on the theory that prevention is better than cure. On the same principle may not our exodontist friends be called in for their exterminating activities, and thus free the rising generation of teeth which in the course of time may have their roots infected and abscessed? *I protest against the too free use of the therapeutics of organic mutilation. If the craze for violent removal goes on, it will come to pass that we shall have a gutless, glandless, toothless, and perhaps, thanks to psychology and surgery, a witless race.*

DENTAL THERAPEUTICS BASED ON CLINICAL AND ROENTGEN-RAY INVESTIGATIONS.

William Middleton Fine.

As a dentist I am forced to believe that too many teeth are extracted in the expectation that their removal will cure systemic disturbances. Because it is possible to demonstrate the same microorganisms in pulpless teeth and in arthritic joints, it should not be stated that the teeth are invariably the primary cause of the infection. The extraction of badly decayed teeth with root abscesses, or their restoration to health and usefulness, removes one of the contributing factors in the cause and development of many diseases. *I do not share the belief that all nonvital teeth should be removed.* Our bodily protective processes prevent well treated teeth, without living pulps, being the direct cause of disease. Talbot would lead us to believe that all the shadows in roentgenograms of dead teeth are not abscesses, and that these teeth should not be extracted ruthlessly. I agree with those who advise the extraction of dead and diseased teeth after a thoro attempt to effect a cure has failed or is doubtful. It is more than likely that 75 per cent of the shadows in the roentgenograms at the apical ends of teeth have been caused by irritation from mechanical treatment and the use of drugs in dental operations, and hence these teeth are removed unjustifiably. I have seen teeth that roentgen-ray examination indicated were abscessed—as some men would say—remain fifteen years or longer without any symptom of disease, local or general. *I received recently three cards from men announcing that they were giving up general practice to specialize in extraction of teeth. We do not need three new extractors every week.*

PRESENT STATUS OF ORAL SEPSIS IN RELATION TO SYSTEMIC DISEASE.

James M. Anders.

The importance of the relation of tooth root infection to systemic diseases cannot be over-emphasized from the point of view of study and investigation. Our knowledge of the flora of the mouth, as related to special affections, is still imperfect. A closer cooperation between dentist and physician, along bacteriologic lines, is urgently needed to deal intelligently with affections of the teeth and alveolar processes, and to correct the haphazard sacrifice of the masticating apparatus. I recall a case, one of epilepsy, in a young woman, aged 19, in which, on the advice of a physician, all the teeth, altho in good condition, were extracted, without, of course, any effect on the epilepsy. It behooves physicians and dentists to oppose the appalling present rate of removal of teeth. It has been shown that after the fortieth year of life, disseminated infections leading to constitutional disturbances are more frequent and of more serious character than in younger subjects. That many morbid medical conditions may be of oral origin is shown in their cure following the removal of the foci of oral

infection. Among many such medical conditions are arthritis, endocarditis, pericarditis, myocarditis, gastritis, myocardial degeneration, chronic nephritis and exophthalmic goiter. Gingival and dental diseases, however, are rarely the sole cause of the morbid states for which gums and teeth may be held responsible. Before teeth are condemned, it is a matter of vital importance to determine that other than oral infectious foci are not present. Treatment based on roentgen-ray studies alone is unwise, since the deeper dental lesions may be simulated by other local conditions, and an abscess which actually exists may not be shown. The local and clinical features are to be noted carefully, and extreme caution should be observed in ascribing a systemic infection to the mouth condition. Bacteriologic study is essential in oral infections. Sanitary oral cavities are potent factors in limiting the incidence and spread of communicable diseases.

Roentgen-Ray Studies of Dental Defects.

Henry K. Pancoast.

The roentgenologist is not able to judge of the direct connection between dental conditions and their supposedly resultant systemic conditions. This is the work of the internist. Not all "clear areas" are due to abscesses at the roots of teeth. Some may be due to old infections, others to chemical irritants. If read properly, however, most these "clear areas" represent active abscesses. *I am opposed to the wholesale extraction of teeth.* In many instances it is possible to treat abscessed teeth successfully and have good service from these teeth afterward. An abscess may be present at the root of a tooth and not show in the roentgenogram, but that is a rare occurrence. Experience in the interpretation of the roentgenograms is more important than the technic, and such interpretation is best carried out by the dentist and the roentgenologist in collaboration.—*A. M. A. Journal, Feb. 14, 1920.*

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VOL. 7 MARCH, 1920 No. 3

Editorial Department.

THE SLAUGHTER OF TEETH.

Slaughter implies ruthlessness, wantonness, unnecessary destruction and apparently the term is correctly descriptive of what has happened. Voices are being raised against the procedure and those who practice it, voices that are not as welcome as they might be because they are voices from the outside. We recall that before, external criticisms have been made against the dental profession and we also recall our resentment when they occurred. Again the faultfinding voice is from the medical profession. "The whole trouble seems to be the lack of good judgment on the part of dentists who are going to the extremes in not desiring to take the consequences of leaving focal infection in the

mouth." A dentist whose name is familiar in our journals voices the following: "If the dental profession as a whole does not cease handling pulpless teeth in the incompetent manner in which we know from an examination of thousands of cases they have been handled, then the medical profession will exercise their prerogative and say when we shall and when we shall not handle pulpless teeth." Imagine such a thing!

Since the findings of Rosenow and Billings, with the showings of the radiograph to encourage us we have extracted with high resolve. To add to our enthusiasm we have had reports from all sides of very remarkable cures of various baffling ills as a result of our extractions. Certainly a tooth should get no consideration when the general health was jeopardized! And for the most part it got none. No count has been officially reported of the number of times teeth have been removed with the best of motives and following quite far reaching promises in some instances with no results at all. Still we have not been startled into conservation altho putting a tooth back after extraction has disappointed us and has never become popular. Perhaps our confidence in artificial restoratives has comforted us.

And to leave a bad matter still bad we have no authority whose word can be final in this matter. Orthodoxy in science is not yet. Considering suppurative pericementitis and apical abscesses as the principle causes of extraction, dental opinion as voiced by those whose voices are heard the oftenest and by that token thought by many to be authoritative is a quagmire of contradiction, misinformation, unsupported opinion and pseudo-science. To get a conception of our status on this most important subject one needs only to read the current offerings of our magazines.

And furthermore medicine has helped us. Quick to accept the findings of the leaders in bacteriological and pathological research the great parent profession was as quick to put the findings to effect with the result that daily patients were sent to the radiographer and thence to the dentist with orders for extraction. It was a good beginning; the beginning was made where it was the easiest and the patient was duly impressed with the up-to-date intelligence of the physician. There was no palliative consideration for the teeth for what is a mere tooth? And the dentist, desiring to be no whit behind the physician extracted. In this combination the dentist was to blame. He is supposed to know something about teeth while the physician knows nothing about them. What the schools give medical students about dental tissues and diseases is a travesty.

Another collaborator in the slaughter was the radiogram. The elusive shadow with its enigmatic suggestion of ill aided and abetted

edentulousness. For a long enough period the film and forceps might have been the dental coat of arms. And who would hang his honor to a film today. But the skiagram is the last word in science and we are scientists so—exeunt. Often the radiographer returned a diagnosis with the film until dental pride grew tender and then with ethical religiosity he suggested "diagnosis upon request." And frequently the X-ray man was not a dentist!

All the while there have been conservatives who urged that we were too free to extract. There are men in our profession whose words are always "apples of gold" if we would only listen to them. Thumbing our literature it is easy enough to find them, words of council, words of fear—fear of the far swing of the pendulum. In their long experiences they have seen great enthusiasms sweep over the profession before, only to leave a wake of shattered hopes and a clientele rich in resentment. They foresaw this day too and urged wisdom and discretion only to be regarded too often as old fashioned and behind the times. Also these men do not run to print as do so many whose flow of new thought affects a screen for hiding previous ignorance.

Dentists must realize that no substitute they can make can take the place of the teeth they extract. They must learn that the patient sent by the physician for extractions has other possible sources of infection besides the mouth and that mouth sanitation might be attempted to show whether the mouth is the contributing cause or whether there is some other. "The individual" says one, "who advocates complete destruction of the dental organs in order to rid the body of streptococcal growths evidences profound ignorance." And he might have added that the dentist who extracts without giving the case the most complete examination before extracting except in the obvious instance commits a crime. Heart disease, frequently caused by oral infection, is a greater menace than tuberculosis, but that does not justify extraction without a little diagnostic cerebration.

Announcements

NATIONAL DENTAL ASSOCIATION, 1920.

August.

23-24-25-26-27—Boston.

April.

5-7—American Society of Orthodontia, Chicago, Ill.

STATE SOCIETIES.

March.

15-16-17-18-19-20—Oklahoma, Tulsa.
17-18-19—Vermont, Burlington.
22-23-24-25—Illinois, Chicago.
22-23-24-25-26-27—Kansas, Wichita.
29-30-31, April 1-2-3, South Dakota, Sioux Falls.

April.

7-8-9—Kentucky, Louisville.
12-13-14—Michigan, Detroit.
12-13-14—Missouri, Kansas City.
13—Alabama, Mobile.
14-15-16—West Virginia, Charleston.
19-20-21-22-23—Mississippi, Jackson.
20-21-22—Connecticut, New London.
27-28-29—Pennsylvania, Reading.

May.

Massachusetts, Boston.
North Dakota, Grand Forks.
4-5-6—Iowa, Cedar Rapids.
13-14-15—New York, Albany.
17-18-19-20-21-22—Nebraska, Lincoln.
17-18-19-20—Indiana, Indianapolis.

June.

Maryland, Baltimore.
Maine.
New Hampshire, Manchester.
New Mexico, Albuquerque.
Southern California, Los Angeles.
South Carolina, Columbia.
Utah, Provo.
9-10-11—Georgia, Atlanta.
14—Colorado, Colorado Springs.
14-15—Wyoming, Cheyenne.
15-17—Florida, Miami.
22-25—North Carolina, Wrightsville Beach.

July.

New Jersey.
Virginia, Old Point Comfort.
13-14-15—Wisconsin, Milwaukee.

November.

18—District of Columbia, George Washington University, Washington, D. C.
Arizona, Phoenix.

December.

2-3-4—Ohio, Columbus.
10—Delaware, Wilmington.

Dates to Be Announced.

Arkansas, Little Rock.
California State.
Idaho, Pocatello.
Louisiana, New Orleans.
Montana, Great Falls.
Oregon, Portland.
Tennessee, Chattanooga.
Washington, Tacoma.

CANADIAN DENTAL ASSOCIATION.

The Canadian Dental Association will hold its tenth biennial meeting in Ottawa, Canada, August 17th, 18th, 19th, and 20th, 1920.

SYDNEY W. BRADLEY, Sec'y,
206 Laurie Ave. W., Ottawa, Canada.

INDIANA STATE DENTAL ASSOCIATION.

The sixty-second annual meeting of Indiana State Dental Association will be held in the Claypool Hotel in Indianapolis, Ind., May 17-18-19-20, 1920.

A. J. KIMM, Secretary,
704-5 Citizens Bank Bldg., Evansville. Ind.

NORTH CAROLINA DENTAL SOCIETY

The forty-sixth annual meeting of the North Carolina Dental Society will be held in Wrightsville Beach, N. C., June 22, 23, 24 and 25.

H. L. KEITH, Secretary,
Hendersonville, N. C.

STATE OF VERMONT BOARD OF DENTAL EXAMINERS.

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice in Vermont, will be held at the State-house, Montpelier, June 28-29-30.

Candidates will present for registration and preliminaries at ten A. M. Monday the 28th.

To be eligible for examinations a candidate must be (1) twenty-one years of age, (2) a graduate of a high school of the first class, (3) a graduate of a reputable dental college.

Applications must be in the hands of the Secretary not later than June 21st.

For further information and application blank, address,

HARRY F. HAMILTON, Sec'y,
Newport, Vermont.

DENTAL SOCIETY OF THE STATE OF NEW YORK.

The fifty-second annual meeting of the Dental Society of the State of New York will be held in Albany, May 13, 14, and 15, 1920, at the Hotel Ten Eyck. An interesting program of essays and clinics is being prepared and will be announced later. All ethical dentists residing in New York and adjoining states are cordially invited to attend the meeting.

Dr. L. S. Blatner, 346 State St., Albany, N. Y., is chairman of the Exhibits Committee.

A. P. BURKHART, Sec'y,
52 Genesee St., Auburn, N. Y.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The next examination of the Wisconsin State Board of Dental Examiners will be held in Milwaukee beginning June 21st, 1920.

All applications and credentials must be in the hands of the Secretary at least ten days before the examination.

Full information and application blanks may be received by addressing

WILLIAM KETTLER, Secretary,
801 Third St., Milwaukee, Wis.

AMERICAN INSTITUTE OF DENTAL TEACHERS.

At the annual meeting of the American Institute of Dental Teachers, held at Detroit in January, the following officers were elected:

President—Dr. Arthur D. Black, Chicago.

Vice-President—Dr. Guy S. Millberry, San Francisco.

Secretary-Treasurer—Dr. Abram Hoffman, Buffalo.

Executive Board—Dr. A. H. Hipple, Omaha; Dr. A. E. Webster, Toronto, Ont.; Dr. E. D. Coolidge, Chicago.

ABRAM HOFFMAN, Secretary,
381 Linwood Avenue, Buffalo, N. Y.

INDIANA STATE BOARD OF DENTAL EXAMINERS.

The next Indiana State Dental Examination will be held in Indianapolis June 14th to 20th inclusive.

Applicants will be accepted from Class A and B Colleges.

Preliminary Educational Certificates must be examined by State Superintendent of Public Instruction two weeks in advance of the examination.

For further instructions and application blanks address: H. C. McKittrick, D. D. S., 1006 I. O. O. F. Bldg., Indianapolis, Ind.

MINNESOTA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Minnesota State Board of Dental Examiners, will be held at the College of Dentistry, University of Minnesota, Minneapolis, Minnesota, June 18th, 1920, beginning promptly at 9:00 A. M., for the examination of applicants for licenses to practice dentistry, and will continue during the following week.

The examination of applicants for licenses as dental nurses, will be held, Saturday, June 19th, beginning at 1:00 P. M.

All applications must be in the hands of the Secretary by June 10th. Fee for examination for dental license, $25.00. Fee for examination for dental nurse's license, $10.00.

Further information, and application blanks, may be received by addressing

C. G. GILLAM, Sec'y,
Austin, Minnesota.

BOARD OF DENTAL EXAMINERS OF CALIFORNIA.

The next meeting of the Board of Dental Examiners of California for the purpose of examining applicants for a license to practice dentistry in that State will be held in the City of San Francisco, beginning on June 21, 1920, at 9:30 A. M. Each applicant shall file with the Secretary of the Board 15 days before that date the following credentials: (1) diploma or certificate of graduation from a reputable dental college approved by the Board; (2) a diploma from an accredited high school or a certificate signed by the State Superintendent of Public Instruction (or similar officer) to the effect that the applicant has had scholastic preparation equivalent in all respects to that demanded for graduation from a high school giving a four years course of instruction. In lieu of high school credentials, an applicant who has been a licensed practitioner of dentistry of some other state of the United States for a period of at least five years, shall file such license or licenses which will be accepted; (3) a testimonial of moral character; (4) a recent unmounted photograph of the applicant.

For further information, address the secretary, C. A. HERRICK, D. D. S.,
133 Geary St., San Francisco, Calif.

ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE.

The Annual Meeting of the Alumni Society of the Philadelphia Dental College (Temple University) will be held on Wednesday, April 21-1920, at 9 A. M., in the college building at 18th and Buttonwood Streets, Philadelphia. All members should note the date, and arrange to be present. If you are not a member, you are welcome to come and enjoy the P. D. C. brand of clinics and papers. We have secured as essayist, Dr. Harvey J. Burkhart, of the Rochester Dental Dispensary, past President of the National Dental Association, and a member of the International Congress of Dentists. His subject is Oral Hygiene, a very important subject just at this time to all dentists.

FRANKLIN S. FLUCK, Pub. Com.
2440 N. 7th St., Phila., Pa.

ILLINOIS STATE DENTAL SOCIETY.

The fifty-sixth annual meeting of the Illinois State Dental Society will be held in the Congress Hotel, Chicago, March 22, 23, 24 and 25, 1920.

The following essayists have been secured: Dr. Alfred C. Fones, Bridgeport, Conn.; Dr. Charles S. Essig, Philadelphia, Pa.; Dr. Wm. H. G. Logan, Chicago; Dr. Newton G. Thomas, Chicago; Dr. Hart J. Goslee, Chicago; Dr. F. E. Roach, Chicago; Dr. K. W. Knapp, Des Moines, Iowa; D. A. A. Herdliska, United States Public Health Service, Washington, D. C.

A most cordial invitation is extended to all ethical practitioners in Illinois and neighboring states.

G. WALTER DITTMAR, Pres.
J. P. LUTHRINGER, Secy.

PENNSYLVANIA STATE DENTAL SOCIETY.

The fifty-second annual meeting of the Pennsylvania State Dental Society will be held in the Rajah Theatre, Reading, Pa., April 27, 28 and 29, 1920. An interesting and instructive program has been prepared. All ethical practitioners are invited to be present.

W. L. FICKES, Sec'y,
6004 Penn Ave., Pittsburgh, Pa.

SOUTH DAKOTA STATE DENTAL SOCIETY.

The 38th annual meeting of the South Dakota State Dental Society will be held in Sioux Falls, March 29 to April 3, 1920. One week of post graduate instruction will be given under the following clinicians:

Dr. Arthur E. Smith, Chicago, Ill.
Dr. F. Ewing Roach, Chicago, Ill.
Dr. Dayton Dunbar Campbell, Kansas City, Mo.
Dr. T. W. Maves, Minneapolis, Minn.

ERNEST W. ELMEN, Secretary,
608 S. F. National Bank Bldg.,
Sioux Falls.

MICHIGAN STATE DENTAL SOCIETY.

The next meeting of the Michigan State Dental Society will be held at the Hotel Statler, Detroit, Mich., April 12, 13 and 14, 1920. The chairman of local arrangements is William H. Waller, 613 Washington Arcade, Detroit.

CLAUDE S. LARNED, Secretary,
614 Post Bldg., Battle Creek, Mich.

MISSOURI STATE DENTAL SOCIETY.

Meeting of the Missouri State Dental Association to be held at the Baltimore Hotel, Kansas City, Missouri, April 12, 13, 14, 1920.

H. C. POLLOCK, Secretary,
724 Metropolitan Bldg., St. Louis, Mo.

MISSISSIPPI DENTAL ASSOCIATION.

The Mississippi Dental Association will hold its annual meeting at Jackson, April 19-23, 1920, inclusive.

W. F. BEAVERS, Secretary
Meridian, Miss.

KENTUCKY STATE DENTAL SOCIETY.

The next annual meeting of the Kentucky State Dental Association will be held in Louisville, April 7-8-9, 1920.

A program of unusual interest has been planned. Address all correspondence to W. M. Randall, Secy., 1035 Second St., Louisville, Ky.

SIGMA EPSILON DELTA.

The next regular meeting of the Grand Council of the Sigma Epsilon Delta Fraternity, will be held at the Hotel Astor, 44th Street and Broadway, New York City, on Tuesday, March 23rd, at 8:30 o'clock. Full representation from all chapters is requested.

By order of the Grand Council.
ROBERT E. ELSTER, Master.

IOWA STATE DENTAL BOARD.

The Iowa State Board of Dental Examiners will meet for purpose of examining candidates for license to practice in Iowa, at Iowa City, College of Dentistry, beginning Monday, June 7, 1920, 9 A. M.

For further information and application blanks, address

DR C. B. MILLER, Sec'y,
726 Fleming Bldg.,
Des Moines, Iowa.

AMERICAN SOCIETY OF ORTHODONTISTS.

The next meeting of the American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Ill., Monday, Tuesday, and Wednesday, April 5th, 6th and 7th. Those interested in Orthodontia are invited to attend.

ALUMNI SOCIETY OF THE PHILADELPHIA DENTAL COLLEGE.

The annual meeting of the Alumni Society of the Philadelphia College will be held on Wednesday, April 21, 1920, at 9 A. M. in the college building at 18th and Buttonwood Sts., Philadelphia. All members of the Alumni should note the date and arrange to be present.

FRANKLIN S. FLUCK, Pub. Com.

ALUMNI SOCIETY OF THE DEWEY SCHOOL OF ORTHODONTIA.

The next annual meeting of this society will be held on April 1-2-3, 1920, at the Edgewater Beach Hotel in Chicago.

The usual high standard of the meetings of this Society will be maintained. One half day will be devoted to clinics.

All interested in Orthodontia are cordially invited to attend these meetings.

GEORGE F. BURKE, Secretary.
741-45 David Whitney Bldg.
Detroit, Michigan.

NORTHERN OHIO DENTAL ASSOCIATION.

The Northern Ohio Dental Association will meet at the Hotel Statler, Cleveland, June 7th, 8th and 9th. Post-graduate courses will follow on the 10th and 11th.

GEORGE B. SMITH, Secretary,
Fremont, Ohio.

TENNESSEE STATE DENTAL ASSOCIATION.

The 53rd annual meeting of the Tennessee State Dental Association will be held May 27, 28 and 29, 1920, at Chattanooga, Tenn.

OLIVER J. O'NEAL,
Chairman Publicity Committee,
Chattanooga, Tenn.

DENTAL EXAMINATIONS IN NEBRASKA.

June 8 and 9—Practical examination, Creighton Dental College, Omaha.

June 8 and 9—Practical examination, University of Nebraska, College of Dentistry, Lincoln.

June 10, 11 and 12—Written examination, State House, Lincoln.

All applications should be on file with this department not later than the 24th day of May.

DEPARTMENT OF PUBLIC WELFARE,
H. H. Antles, Secretary,
Lincoln, Nebr.

MAINE BOARD OF DENTAL EXAMINERS.

The next meeting of the Maine Board of Dental Examiners will be held at the State House, Augusta, Maine, July 7, 8 and 9, 1920, beginning at 8:30 A. M. July 7.

All applications must be in the hands of the secretary on or before June 28, 1920. Fee for examination, Dentists $20,

Dental Hygienists, $10. Any further information and application blanks will be furnished by addressing

HENRY GILMAN, Sec'y,
192 State St.. Portland, Maine.

BOOKS AND JOURNALS WANTED FOR A NATIONAL ASSOCIATION DENTAL LIBRARY.

The Association is gathering material for a great national dental library. We need your assistance. Send us the following items:

Dental text books, old or new; Dental Journals, College year books, College announcements, State Board Dental Reports, State Dental Society bulletins and programmes, State Board reports, Photographs, Engravings or Prints of Dentists, any print or picture relating to the practice of dentistry.

If the shipment weighs under fifty pounds send it by express, collect. If over that amount before sending please ask for shipping directions. Address:

The National Dental Association,
127 No. Dearborn St., Chicago, Ill.

DENTAL CORPS ORDERS FROM WAR DEPARTMENT.

DENTAL CORPS.

Maj. Frank W. Boville honorably discharged.

Resignation by John L. Davis as temporary captain and as first lieutenant (Regular Army) accepted.

1st Lieut. Oscar R. Reed, to San Antonio, Texas, air service flying school, Kelly Field, for duty.

1st Lieut. Melville A. Sanderson, to Fort Warren, Mass., for duty.

1st Lieut. James A. Curtis, Jr., to Camp Gordon, Ga., for duty.

—Army and Navy Register, February 7.

Lieut. Col. Harold O. Scott to Fort Leavenworth, Kans., for duty.

Capt. Elmer J. Nieder to Fox Hills, N. Y., general hospital 41, for duty.

Capt. Hooker O. Lindsey to East Potomac Park, D. C., for duty.

Resignations by Capts. Henry H. Collins, Orville A. Grove accepted.

First Lieut. William F. Scheumann to West Point, N. Y., Military Academy, for duty.

First Lieuts. Grady P. Russell, Frank D. Voigt honorably discharged.

—Army and Navy Register, February 14.

Maj. Raymond W. Pearson to Fort Monroe, Va., for duty.

Capt. Waldo J. Adams to Camp Normoyle, Tex., for duty.

Capt. Hooker O. Lindsey to East Potomac Park, D. C., for duty.

Capt. Alexander M. Smith, Jr., to San Antonio, Tex., zone supply office, general supply depot, for duty.

Capt. Neil J. McCollum to Dayton, Ohio, McCook Field, for duty.

The resignation by Leslie A. Gould as temporary captain and as first lieutenant (Regular Army) is accepted.

1st Lieut. Lemuel P. Woolston to Fort Bliss, Tex., base hospital for duty.

The resignation by 1st Lieut. Richard C. Hoblitzell is accepted.

1st Lieut. Wallace B. Bruce, honorably discharged.

—Army and Navy Register, February 21.

Lieut. Col. John A. McAlister, Jr., to Fort Sheridan, Ill., general hospital 28, for duty.

Maj. Leonard G. Mitchell and First Lieut. Earl W. Guthridge honorably discharged.

Capt. Everett H. Ruggles to Camp Dix, N. J., for duty.

Capt. Eugene A. Smith to Washington and report to attending surgeon for duty.

Resignations by Capts. Clarence R. Jacobson and Richard K. Thompson accepted.

First Lieut. Carl E. Safford to New York and to Panama about March 5 for duty.

First Lieut. Jay R. Haskin to Camp Grant, Ill., for duty.

First Lieut. John A. Belfils to Camp Alfred Vail, N. J., for duty.

—Army and Navy Register, February 28.

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